Vol. XXIII. Part 6.

NATIONAL MUSEUM OF VICTORIA Pisces

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The Journal of the Department of Agriculture of Victoria, Australia.

June, 1925.

PRINCIPAL CONTENTS

Crop and Fallow Competitions

Vegetable Pests

Egg-Laying Competition Report

The Woolly Aphis Parasite

Wheat Experiments

Standard Herd Test—Quarterly Report

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OF

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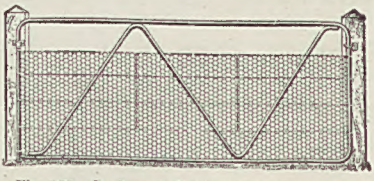

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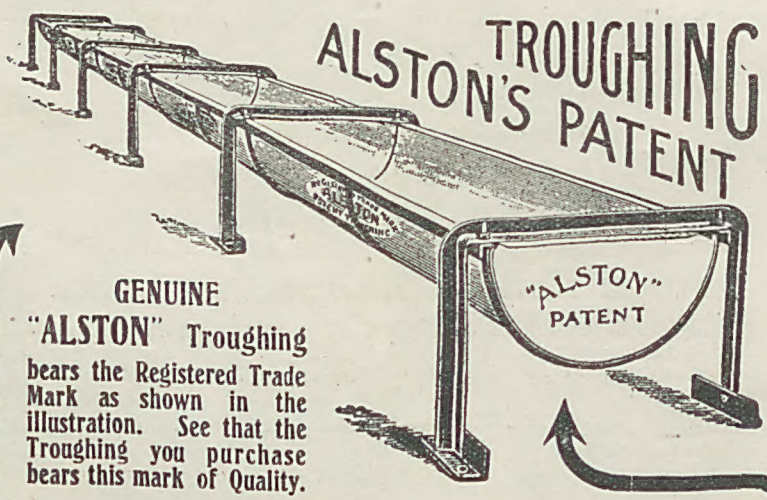

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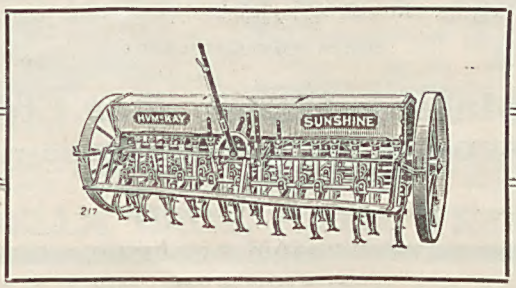

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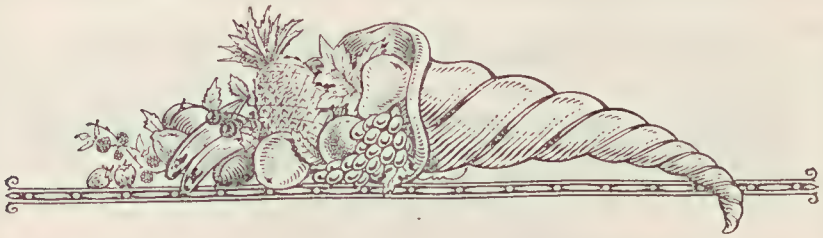

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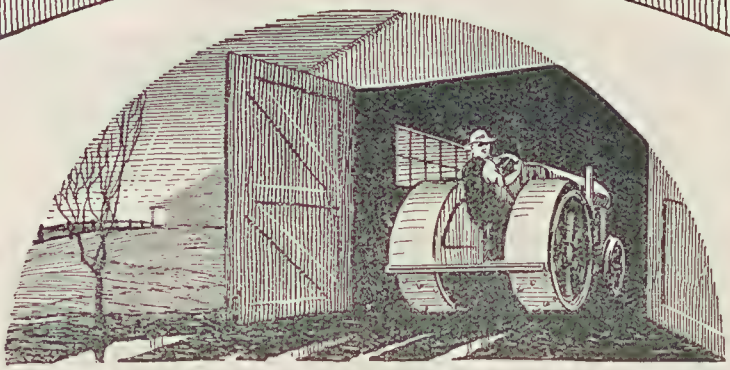

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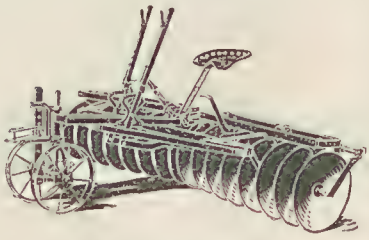

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NATIONAL MUSEUM OF VICTORIA

THE JOURNAL

OF THE

Department of Agriculture

OF

VICTORIA.

Vol. XXIII. June, 1925. Part 6.

VEGETABLE PESTS.

By C. French, Jun., Government Entomologist.

During the past few years many mixtures for destroying vegetable pests have been placed on the market, and during the same time several experiments have been made by the Science Branch of the Department of Agriculture. Details of those which have proved most successful are given below.

Thrips.

Thrips cause the flowers on early tomato plants to turn brown, shrivel up, and fall. They also attack the flowers of beans, peas, &c.; in fact, almost every kind of flower, and thus are responsible for considerable damage. This insect has a habit of crawling into the centre of the flower, and this makes it difficult to deal with, but in the case of such plants as tomatoes, peas, and beans, can be more readily treated.

The following remedies have proved successful:—

Benzole emulsion.—This is a patent preparation, and can be purchased at any of the leading seed shops in Melbourne. One tin full (1 lb.), when diluted, makes 5 gallons of spray. The smell of the benzole remains on the plants for several days.

As a deterrent, spraying with coal tar water or a weak kerosene emulsion is recommended. A good hosing with cold water is also beneficial. The formula for coal tar water is as follows:—Boil one pound of coal tar in 2 gallons of water, and while hot add from 50 to 100 gallons of water. Nicotine sulphate or black-leaf 40 are excellent sprays.

Rutherglen Bug.

This is another insect which is causing a lot of trouble to the vegetable grower. It is a minute grey-coloured plant bug, and the perfect insect measures about 1½ lines in length. It is very active, and has the habit of dropping or flying to the ground when plants on which it is resting are touched. It deposits its eggs amongst rubbish and weeds or under the soil.

Tomatoes, beans, peas, potatoes, and other such vegetables are its favorite foods. Benzole emulsion and coal tar water give good results if sprayed on the infested plants. The remedies recommended for thrips could also be used.

When a gentle breeze is blowing, make smudge fires at intervals amongst the vegetables, and sprinkle a little sulphur on them. The phenyle spray has recently been used with much success. This is prepared as follows:—Take 1 quart of phenyle, 3 lb. washing soda, one bar yellow soap, 40 gallons water. Shred the soap and dissolve it in hot water, to which the other ingredients should be added, and the mixture made up to 40 gallons.

Cut Worms.

Caterpillars belonging to the genera *Agrotis, Heliothis, Chloridea, Plusia,* are the chief members of this group. They are most destructive, and attack tomatoes, capsicums, beans, onions, cabbage, lettuce, potatoes, &c. The caterpillars hide amongst the débris and soil during the day time, and at night come up to feed. This explains how it is that a whole plant laden with tomatoes can be destroyed in one evening, although there may be no trace of any insects. If the ground around the plants be turned up the grubs, usually curled up, will be discovered about an inch under the soil. The moths hide in the day time under grass, wood, stones, bags, &c., and when darkness is setting in they fly about from plant to plant, depositing their eggs as they go.

The arsenate of lead spray has proved one of the best remedies yet discovered for these pests. Cabbage, lettuce, and other such vegetables should be washed before using. Poisoned baits are also used with success; the formula for their preparation is as follows:—Bran, arsenic, and sugar mash. The best proportion to use is 1 part (by weight) of arsenic, 1 of sugar, and 6 of bran, with a sufficient quantity of water to make a wet mash. This preparation is usually made in wash tubs or half barrels. One of these is filled about three-fourths full of dry bran; to this is added about 5 lb. of arsenic, which is thoroughly stirred through the bran with a spade or shovel; 5 lb. of sugar is next thrown into a pail, which is then filled with water, and the sugar is stirred until it dissolves. When the sugar water has been poured over the bran and arsenic, and the three well stirred, more water is added, and the stirring continued until every portion of the mash becomes thoroughly saturated. About a teaspoonful of this mixture is placed at the foot of each plant or shrub infested. If possible it should be dropped in the shade. Care must be taken that this bait is placed beyond the reach of children and domestic animals.

Growing crops may be treated in the following manner:—Place between the rows or at short distances apart bundles of any succulent weed or vegetable previously poisoned by being dipped into a strong mixture of Paris green (1 oz. to a bucket of water). The cut worms eat the poisoned plants, bury themselves and die. In hot dry weather the bundles should be put out after sunset.

Snails and Slugs.

These pests are always hard to keep under control. Ordinary remedies, such as soot, lime, carbolized sawdust, salt, &c., are, of course, of much assistance, but of themselves are not sufficient protection. Tobacco dust (pestend) may also be sprinkled amongst the plants.

In calcium arsenate we have a mixture which should soon destroy them. This is used as follows:—One lb. of calcium arsenate is mixed with 9 lb. of bran, and the whole made into a stiff mash with molasses and water. Small pieces are distributed along the rows of affected plants at dusk.

Pumpkin Beetle.

Last year this destructive insect caused much damage to melon, cucumber, and pumpkin plants and others of the same group, also to cherries. They are usually very prevalent from December until February. A very common mistake is made by confusing this pest with the beneficial ladybird, and correspondents often write asking for advice as to the destruction of the latter insect, under the impression that it is destroying their vegetables. The distinctive feature about the pumpkin beetle is that it is elongated in shape, while the ladybird is almost round. The following are preventives:—Coal tar water, Paris green, kerosene emulsion, and arsenate of lead. Some years ago Inspector E. Wallis found that the crude oil of tar remedy gave good results, the following being the formula:—Crude oil, ½ pint; soft soap, ½ lb.; caustic soda, 1 oz.; water, 5 gallons. Boil 1 pint of water, and in it dissolve the soap and soda; add oil of tar, agitate well, and add remainder of water; cool and use.

Cabbage Moth.

The larvae of these moths usually make their appearance on the cabbage, cauliflower, turnip, and radish plants in the winter months. Spray with arsenate of lead. Coal tar is also a good mixture to use against this pest, the proportion being the same as for thrips.

Cabbage Aphis.

For this aphis spray with nicotine prepared as follows:—Steep 1 lb. of tobacco in 1 gallon of hot water, and allow it to soak for 24 hours. Boil 1 lb. soap in 1 gallon of water until the soap is dissolved. Strain the tobacco water into the soap water. Stir well, and make up to 5 or 6 gallons. Use waste stems of the tobacco. Nicotine sulphate or black-leaf 40 is also a good spray.

Metallic Tomato Fly.

This handsome fly, which is of a metallic colour, has at times caused some damage to ripe tomatoes. But I am inclined to think it attacks only over-ripe or damaged tomatoes, thereby hastening decay; a sound tomato is rarely attacked. When once the maggots are in the tomatoes it is an impossibility to reach them, and such tomatoes should be picked and burnt or placed in boiling water. Deterrents such as recommended for thrips are also beneficial.

Bean Butterfly.

This serious pest, a small blue butterfly, causes severe losses to growers of beans. A good spray with benzole emulsion, arsenate of lead, or coal tar water will, however, be found of much use, if necessary.

Tomato Weevil.

This vegetable pest is still present in large numbers of gardens near the metropolis, and has become a serious pest to potatoes and tomato plants in most parts of Victoria. By eating the stems through at the base it causes young plants to fall to the ground. Last season many kinds of vegetables, viz., carrots, onions, beans, radishes, &c., were attacked by the larvae of these insects. Garden plants are also attacked by it. The larvae is of a light pea-green colour, and about ¼ inch long. In the day time it is usually found in the soil a few inches from the surface. When about to pupate it constructs a cocoon made of soil, in which it remains for a couple of months until it emerges as the perfect beetle. The beetle, which measures about ¼ inch in length, varies in colour from light grey to dark brown. Some specimens have a V-shaped mark on the wing cases. It is quite as destructive as the larvae, and, like it, goes down into the soil in the day time, and comes up to feed at night. The larvae often feed in the day time as well as at night, but the perfect insects rarely do so.

All weeds, especially marsh mallows, on land adjoining vegetable gardens should be destroyed. Use poisoned baits as for cut worms. Spray plants with arsenate of lead, 1 in 25.

Red Spider.

This is a pest well known to vegetable growers. It belongs to the group of Acarids or Mites, and is therefore strictly speaking not an insect. Its eggs, which are almost transparent, remain both in the soil and in the crevices of stakes, plants, and other objects during the winter. The red spider is a tiny animal, just visible to the naked eye, and is almost transparent; in colour it varies from light reddish to quite red. Generally, it feeds on the underside of the leaves of various vegetable plants, particularly beans, melons of various kinds, and makes a kind of web underneath the leaves.

Vegetables should be well watered in the summer, as when once the ground is allowed to get dry the plants are attacked by the red spider.

Spraying with deterrents such as quassia chips or a weak kerosene emulsion is recommended. Coal tar water and benzole emulsion may

also be used. A remedy that has proved of great use in England is paraffin jelly, the formula for which Professor F. V. Theobald gives as follows:—Paraffin, 5 gallons, soft soap, 8 lb.; boil these together, and when boiling add about 1 pint of water, and then stir well. This becomes a jelly when cold, and every 10 lb. should be mixed with 40 gallons of water. The above amounts to about 160 gallons of wash. Tobacco sprays, i.e., nicotine sulphate or black leaf 40, are also very reliable.

It is not advisable to apply any spray wash within three days of the previous one. Care should also be taken that the nozzle of the spray pump is directed upwards so as to reach the underside of the leaves.

All stakes, after having been used for tomatoes, &c., should be treated with boiling water before being used again; by this means the eggs of the spider will be destroyed.

Potato Moth.

According to various writers this destructive pest of the potato crop has been known in Australia since 1854, and has spread to all the States. It has caused considerable losses to growers, and is certainly the worst potato pest in the Commonwealth.

The moths are usually more plentiful after a mild warm winter. There are two broods of moths. The first, the winter brood, may destroy the young plants and thereby ruin the crop. The moths of the second brood deposit their eggs on the potatoes themselves when the tubers are stored or are in the field. Occasionally, especially if potatoes are grown in stiff soil, the moths will crawl down the cracks in the ground and deposit their eggs on the tubers. The eggs are usually from 20 to 30 in number and hatch in from six to ten days. In sandy soil, tubers are rarely so attacked. The young grubs, when hatched, usually feed upon the eyes of the potatoes; they then tunnel towards the centre of the tubers, causing them to become brownish-black, and inducing decay. Sometimes when the potato plants are fully grown the female moth deposits her eggs on the leaves. The young grubs feed on the leaves and afterwards gnaw their way down the main stalks, reaching the tubers below. Fortunately for growers the chrysalids of the potato moth are attacked by parasites and bacterial diseases, which destroy great numbers. Various climatic influences will also often help in their destruction.

Life History.

Eggs.—Very minute, of a white colour and glistening.

Caterpillar.—When fully grown it measures about ½ inch long, and is of a faint pinkish colour, with a brown head. It usually pupates under the skin of the potato, and is surrounded or protected by dirt, excrement, &c.

Chrysalid.—The pupa or chrysalid is dark-brown in colour, and is enclosed in a silken bag or cocoon.

Moth.—The moth is small, of a light brownish-grey colour, the size being—body, about ¼ inch in length; front wings, which are darker than the hind ones, female, about ½ inch across when expanded, male slightly smaller. The wings of both sexes are feathery or fringy, but this is not so pronounced in the male as in the female.

Prevention and Remedies.

Dead potato plants, discarded and small potatoes, and rubbish should be gathered and burnt. Old sacks and cases in which there have been infected potatoes should be dipped into boiling water. By this means any grubs and chrysalids secreted in them will be destroyed.

Seed infested with the grubs should never be planted, nor should ground where moth-affected potatoes were grown the previous year be used again for potatoes. Plant the seed deep, and keep it well covered. The ground should be pressed firmly down, and it would be advisable to till it a second time. Never leave potatoes exposed in the field. When they are dug up they should be at once bagged and removed to the storeroom, where they must be placed in bins, pits, or any other receptacles so that moths cannot get at them to lay their eggs in the eyes of the tubers. It is a common practice with many growers to simply heap the potatoes up in the storeroom without any covering, and to leave the doors of the room wide open. It is no wonder that considerable losses occur.

Trapping by means of lamps is of use in destroying the moths, as they fly about at night. Procure an ordinary tin basin, and in this place a brick and enough kerosene to reach half-way up the brick, and on the brick a lighted lamp. The moths are attracted to the light, and, flying against the lamp, fall into the kerosene, which kills them. The basin might be put on an ordinary box, such as a kerosene case. Several of these lamps could be placed in a field of potatoes at night time.

When the moths commence to make their appearance, it is advisable to spray the crop with some arsenical spray, such as arsenate of lead. This will destroy the young grubs as soon as they commence to feed. A good arsenical spray could be prepared as follows:—Boil 1 lb. of white arsenic and 2 lb. carbonate of soda (crystals) in ½ gallon of water for twenty minutes. Separately dissolve 7 lb. of arsenate of lead in 1 gallon of warm water. When both mixtures are cold mix them together. Bottle into twelve 1-pint bottles, and use one bottle to 30 gallons of water. Mix the chemicals in wooden buckets.

As many reliable brands of arsenate of lead are now on the market, and at a fairly cheap rate, the majority of growers may prefer to purchase the ready-made article instead of going to the trouble of mixing this excellent spray mixture themselves.

In cases where spraying will probably be necessary spaces might be left between every few rows of potatoes for the horse drawing the spray pump to pass, otherwise many of the plants will be trampled down. At the present time some excellent motor, automatic, and other spray pumps, specially designed for potato spraying, are on the market, the nozzles being made so that the whole plant may be thoroughly sprayed. Six or more rows of potatoes can be sprayed at the same time. Experiments by the writer and other officers of the Department have proved the value of these pumps, which are now coming into general use.

As the potato moth is proclaimed an insect pest under the Vegetation Diseases Act, it would be advisable that the potato inspectors should inspect all storerooms in the country districts where potatoes are

grown, and see that every precaution is taken by growers to protect the tubers from the ravages of this moth. One careless grower in a district can breed enough moths to ruin all his neighbours' crops, and it is against such a grower that action should be taken.

Jassids, Leafhoppers, Canary Flies or Froghoppers.

These small greenish-yellow insects, not unlike miniature cicadas, are about the size of aphides or green fly. They are very active, and during the summer can be seen in thousands on the leaves of potato, tomato, pea, and other vegetables. Now and again they do a considerable amount of damage. Spray with benzole emulsion at the rate of 1 lb. to 5 gallons water.

Pea Mite.

During the last couple of years these mite have spread rapidly in Victoria, and have done much damage to vegetable and other crops. They are usually very abundant, literally in millions, during the months of April, May, June, and July. The body of the pea mite is of a deep dull blue. It has rather long red legs, covered with very fine white hairs. The mites run very rapidly when disturbed, and soon get out of sight, hiding in crevices or under lumps of earth.

Keep land free from weeds. Clift's manurial insecticide, either dusted over the ground or worked into the soil by a seed drill, will be found most effectual against the mites.

Metallic Flea Beetles

These are native insects. They are usually found feeding on the weed known as "Sheep's Burr" (*Acaena*), and have a habit when disturbed of suddenly hopping from the plant they are attacking. During recent years they have done much damage to turnips, beet, parsnips, parsley, carrot, and other vegetable crops. The perfect insects are dark-violet coloured.

Keep the soil in vegetable gardens well worked. Spray plants with arsenate of lead. Use poisoned baits same as for cut worms.

Woodlice, Slaters, Sow Bugs.

Woodlice are not, strictly speaking, insects, but as they cause considerable damage to vegetables they are included in this article. They are very destructive among carrots, turnips, cabbage, and other vegetables. The common woodlouse is mostly nocturnal in its habits, retiring during the day under stones, logs, débris, old bags, bark, and, in fact, any kind of hiding place that is accessible, and coming forth in the evening to feed. It has a peculiar habit of contracting itself into a ball when disturbed.

Do not allow any débris, old bags, logs, &c., to lie about on fields where it is intended to plant vegetables, as the pests may hide there. Calcium arsenate has recently been used with excellent results against woodlice. Treat soil with manurial insecticide before sowing.

WHEAT EXPERIMENTS AT SALISBURY.

Interim Report furnished to the Nhill Agricultural Society by H. A. Mullett, B.Ag.Sc., Senior Inspector of Agriculture.

Splendid yields were again harvested from the Agricultural Department's experimental wheat field, conducted by Mr. W. E. Dahlenburg, Salisbury. One plot (Nizam) returned 57 bushels per acre, and another (Gallipoli 58/1) 56.8 bushels. The whole field of 6 acres averaged 50 bushels per acre, i.e., 4 bushels per acre better than last year's average, each one-third of an acre.

The plots consist of variety tests with wheat and oats, and also manurial tests with wheat. They were sown on well-worked fallow, on typical black clay loam. Seventy-five pounds of seed wheat were used throughout, and, except on the manurial trials, 1 cwt. of superphosphate.

In addition to these experiments, there were a series of unofficial tests designed to test the value of gypsum as a soil improver on stiff red clays.

RESULTS.

Variety Tests—Wheat and Oats—1924.

Sown 31st May.—75 lbs. graded seed per acre; 1 cwt. superphosphate per acre.

Oats, 50 lbs. per acre; no manure.

		Bushels per acre.
Wheat—		
	Nizam	57.0
	Gallipoli 58/1	56.8
	Marmora	54.2
	Krithia	53.0
	Federation	52.5
	Wannon	51.1
	Empire	49.0
	Rajah	48.4
Oats—		
	Palestine	49.0
	Algerian	44.2

Nizam is a product of a cross made between Indian 17 and Federation wheats. It is a vigorous mid-season wheat, of moderate height, with bald, compact ears, somewhat clubbed at the apex. Nizam gave the highest yield last year in a test with twenty other wheats at Carwarp experimental plots, in the North Mallee. It also gave the highest yield in the Shepparton plots this season, and was highest in several series of plots and in some of the bulk fields at Longerenong College this year. Gallipoli 58/1 is a selection from the Gallipoli which proved tough to strip. Gallipoli 58/1 is satisfactory in this respect. It yielded 54 bushels per acre in a bulk field at Mr. Dahlenburg's, Salisbury.

Palestine oats is a very early variety—from ten to fourteen days earlier than Algerian. It grows very short, and therefore is suitable for growing on fallow or on stubbles for grain. The grain is similar to Algerian.

Manurial Tests, 1924.

Federation Wheat, 75 lb. per acre.

	Sown early. Bushels per acre.	Sown late. Bushels per acre.
No manure ..	.. 44.3 ..	40.3
Super ½ cwt. ..	.. 49.3 ..	45.1
Super. 1 cwt. ..	.. 52.7 ..	49.0
Super 1½ cwt. ..	.. 51.3 ..	48.8
Super. 2 cwt. ..	.. 52.5 ..	49.9

This experiment, as it is now constituted, has been in progress four years, hence a comparison may be made between the yields produced by sowing the various dressings of fertilizer, both early and late.

Farmers' Field Day—Experimental Plots, Salisbury.

Comparison of Yields of Plots Sown Early with those Sown Late.

Average Results for Four Years—1921-1924.

Time of Sowing.	No Manure.	Super. ½ Cwt.	Super. 1 Cwt.	Super. 1½ Cwt.	Super. 2 Cwt.
May	41·1	45·3	46·3	46·5	47·0
June	38·9	41·1	43·1	44·2	43·8
Increase due to early sowing	2·5	3·9	3·2	2·3	3·2

It is commonly supposed that it is desirable to increase the amount of fertilizer used per acre as the season advances. The above results do not support that view on soil such as that on Mr. Dahlenburg's farm.

Manurial Tests—Five Years' Results.

FEDERATION WHEAT, 75 LB. PER ACRE.

Each plot is in duplicate; one set sown early and one late.

——	Yield.	Increase Due to Manure.	Value of Increase at 5s. per. Bush.	Cost of Manure.	Net Profit per Acre.
	bush.		s. d.	s. d.	s. d.
No Manure ..	41·7	..	..	..	..
Super. ½ cwt. ..	44·6	2·9	14 6	2 6	12 0
Super. 1 cwt. ..	45·7	4·0	20 0	5 0	15 0
Super. 1½ cwt. ..	46·2	4·5	22 6	7 6	15 0
Super. 2 cwt. ..	46·2	4·5	22 6	10 0	12 6

A Prolific Cross-bred Wheat.

The fact that the experiments have been in progress five years, and that the plots are in duplicate renders the results very accurate. It is obvious that the land is rich in phosphates, because it does not respond to dressings of phosphate above 1 cwt. per acre. This deduction was confirmed by actual analysis of the soil, which showed it to be much richer than average Wimmera soil—a fact unsuspected when the plots were laid down.

Nevertheless, the results indicate that it is more profitable to use 1 cwt. of fertilizer than ½ cwt., especially as the residual benefit of the heavier dressings is known to be a valuable stimulant to the grass which follows the wheat when the paddock is spelled.

It is undoubted that these plots will become more and more interesting as the years go by, because the yields are so high that the soil is being steadily depleted of its phosphates, except where the heaviest dressings of superphosphate are used.

Unofficial Tests with Gypsum.

With a view to improving the texture of some stiff red soil in the district, preliminary experiments with oats on a strip of exceedingly refractory red soil were laid down in 1923. The oats were sown unusually late, in order to impose the most severe conditions possible. The soil was merely ploughed out of grass and the oats sown. Heavy rain followed immediately, and very poor germination resulted. The oats were resown later with the following results:—

Oats, 1923.

No gypsum	9.2 bushels per acre.
Gypsum, 1 ton	13.9 bushels per acre.

The crop on the portion of the field treated with gypsum kept green longer than on the untreated land, showing that the moisture holding capacity of the soil had been improved. In this and subsequent years both treated and untreated plots received the same quantity of superphosphate.

Inspecting Experimental Plots.

In 1924, it was decided to roughly test the residual effect of the gypsum on the same land, and to that end the oats were merely drilled on the surface of the soil and ploughed in. No gypsum further was applied.

Residual Effect, Oats, 1924.

No gypsum	6.25 bushels per acre.
Gypsum, 1 ton (1923) ..	8.75 bushels per acre.

Again it was noticed that the crop on the gypsum treated land remained green longer.

The yields, of course, are quite below a payable level, but sufficient information has been gleaned to indicate that further experiments ought to be undertaken to measure the immediate and residual effect of gypsum on average red land in the district. Apart from the extensive areas of red land which fringe the black in the Wimmera, almost every paddock has some refractory red soil patches in it. These require different treatment to the black land in the matter of cultivation and time of sowing, hence they present considerable difficulty in being got

into proper condition, and tend to reduce the average yields of the paddocks. Wimmera wheat-growers will therefore welcome any means by which these patches may be so changed in texture that they can be worked similarly to the black soil.

With the object of attempting to measure the effect of treating a mixed red and black paddock with gypsum, three plots, each about an acre, were laid out, and two of them treated with gypsum last spring. However, it was impossible to secure anything like uniform soil conditions on each plot, and in order that the treated land should have no advantage, Mr. Dahlenburg reserved the best land for the untreated plot. The results were as follows:—

WHEAT, 1924.

No gypsum	..	36.0 bushels per acre.
Gypsum, 5 tons per acre	..	39.3 bushels per acre.
Gypsum, 1 ton per acre	..	35.1 bushels per acre.

Judging the Yield of the Wheat Crops.

Thus the experiment was inconclusive, though the levelling up of the height of the crop was most marked, while the treatment had ameliorated the red soil in a wonderful way.

It will be noticed that the maximum dressing tested was 5 tons per acre—a quantity beyond the usual scope of ordinary practice. Five tons, however, is the quantity of gypsum calculated as required to effect the maximum alteration possible in red soil at Nhill; and in any case, as the proportion of red land in black paddocks does not usually reach more than one-fifth of the total, a dressing of 5 tons per acre on the red patches would average only 1 ton per acre on the total acreage, as the black soil would not require to be treated.

Plentiful supplies of gypsum exist near Nhill, and machines are available which distribute the material satisfactorily, and a device can be fitted by which the driver can cut off the flow of the gypsum without stopping the team when a black patch is met with.

WHEAT EXPERIMENTS, WESTERN DISTRICT.

Five Years' Results at Willaura—1920-25.

By H. A. Mullett, B.Ag.Sc., Senior Inspector of Agriculture.

Ninety per cent. of the wheat in this State is grown inside that part of the 20-inch line of rainfall which lies to the north of the Dividing Range. There the soils are reasonably well drained, and the seasons are characterized by moderate rains in winter and spring, followed by hot dry weather at ripening time—conditions ideal for wheat.

The balance of the wheat is produced in moister and cooler districts, and the crop does best in the parts where the conditions approximate most closely to those of the north, viz., on the Western Plains and in the Sale-Maffra area. Elsewhere it is found that oats do much better than wheat, though where the drainage is good, quite satisfactory wheat crops may be raised on some of the richest land; thus, at Koroit, yields as high as 40 bushels an acre have been obtained.

The principal wheat district south of the Divide is on the volcanic plain stretching between Werribee and Willaura, more especially in the area served by the railway from Gheringhap to Willaura. The annual precipitation here averages about 20 inches, and is nowhere more than 25 inches. Oaten hay, oats for grain, wheat, and barley are the usual crops on most of the farms, but each year sees a decline in the demand for hay, due to the ousting of horses by motor transport in the cities. It is inevitable that farmers in these districts will have to curtail their planting of oats in favour of some other crop. One substitute is field peas, another is wheat. Peas do well, and now that the reaper-threshers fitted with the new pea-harvesting machinery are doing satisfactory work, this crop will undoubtdly become more popular.

Though the soil and climatic conditions are not so suitable for wheat as those in the north, very payable crops can be grown; but greater care than is usually given oats is necessary in the preparation of the fallow and in sowing the wheat. Fortunately farmers in the district have ready at their hand a great body of information relative to wheat-growing. This should be specially valuable to growers of oaten hay, who have been feeling the effects of the declining demand for their product, and who are looking to wheat to help them out.

The eastern end of the district is well served by the State Research Farm at Werribee, while the experimental plots conducted by Mr. F. Lindon for the Department for the past five years serve the western end. Complete information on the results of the experimental work at Werribee is available in the *Guide Book* issued from that institution. The results of the experiments at Willaura are furnished hereunder.

Manurial Trials at Willaura.

The soils at Willaura range from sandy loams to fairly stiff clays. None of them is really well drained. After a few years' cultivation sorrel often makes its appearance, and necessitates the land being spelled in grass for a few years. The clay soils have a tendency to run together when wet, hence it does not pay to work them down to too fine a tilth.

The experimental field is 10 acres in area. Five acres are sown to wheat on fallow each year, and 5 acres are fallowed. Each field is subdivided into twenty half-acre plots, twelve as a manurial test, and six as a variety test; occasionally several oat variety plots were added. The fertilizers have been confined to phosphates in various forms, the only nitrogen applied being that included in bone fertilizer. Lime has been tested with and without phosphates, and as local supplies of gypsum were obtainable, a plot treated with gypsum was included.

RESULTS OF FIVE YEARS' TRIALS—1920-25.

—	Average yield for five years.	Increase over no manure plot.	Value of increase at 5s. per bushel.	Cost of manure per annum.	Profit after deducting cost of manure.
	bushels per acre per annum	bushels per acre per annum	per acre. s. d.	per acre. s. d.	per acre. s. d.
No manure*	7·8	..	..	..	..
Lime 10 cwt. (1st year) ..	10·3	2·5	12 6	8 0	4 6
Bone fertilizer, 1 cwt. per annum ..	12·5	4·7	23 6	8 0	15 6
Basic phosphate, 1 cwt. per annum* ..	17·9	10·1	50 6	5 0	45 6
Super. 1 cwt., gypsum 3 tons per acre (1st year)	21·6	13·8	69 0	23 0	46 0
Super. 1 cwt. per acre*	18·8	11·0	55 0	5 0	50 0
Super. 1 cwt. per annum, and lime 10 cwt. (1st year)	20·8	13·0	65 0	13 0	52 0
Super. 2 cwt. per acre	20·7	12·9	64 6	10 0	54 6
Super. 2 cwt. per annum, and lime 10 cwt. (1st year)	23·3	15·5	77 6	18 0	59 6

* Average of two plots—Super. valued at £5 per ton; lime valued at £2 per ton: bone fertilizer, £8 per ton; basic phosphate, £5 per ton; gypsum, 15s. per ton; wheat valued at 5s. per bushel.

The results indicate that, as usual, superphosphate has the greatest influence in increasing the crop yields. Weight for weight, it proved superior to basic phosphate, a form often advocated for acid soils containing iron, such as those of Willaura. Bone fertilizer was very unsatisfactory. Lime, in the absence of superphosphate, was of very little use, but one application of 10 cwt. in the first year of the experiment, applied to plots treated with superphosphate, increased the average yield of those plots by from 2 to 2½ bushels per acre. The highest and most profitable yield 23.3 bushels per acre, was obtained from the plot treated with 2 cwt. of superphosphate and 10 cwt. of lime (one year only).

A heavy dressing of gypsum (3 tons per acre) applied with 1 cwt. of superphosphate, was responsible for a total yield of 21.6 bushels as compared with 18.8 bushels, due to superphosphates, 1 cwt. only. The loamy soil, however, is one in which gypsum was not expected to effect a profound change.

Variety Trials.

The following varieties were tested from time to time:—Currawa, Major, Yandilla King, Federation, Gallipoli, Minister, Graham,

Sterling, Cleveland, Turvey, Crossbred Huguenot x Federation, crossbred Federation x White Fife, Gallipoli 58/1, Viceroy, and Werribee 17. Of these, all but those mentioned below have been eliminated.

The following table gives the average yields of the varieties persevered with for three years, and over:—

	No. of years.	Average yield.
Federation	5 ..	23.2
Yandilla King	5 ..	21.1
Cleveland	4 ..	22.7
Turvey	3 ..	18.6

The yields for 1924 are as follows:—

	Bushels per acre.
Gallipoli 58/1	26.3
Federation	24.6
Yandilla King	21.8
Sterling	20.9
Werribee 17	19.9
Turvey	18.8
Viceroy	16.3
Cleveland	14.2

Superphosphate and Wild Oats.

An interesting feature of the experiments was the result obtained the first year. The land proved to be very foul with wild oats. The yields of the unmanured plots averaged only 4 bushels an acre, but 1 cwt. of superphosphate raised the yield to 14.4 bushels per acre, and 2 cwt. to 17.5 bushels per acre. On the unmanured plot there was a very heavy crop of wild oats, with a thin sprinkling of wheat. On the manured plots the wild oats were markedly fewer. Evidently, then, the fertilizer assisted the wheat to make vigorous early growth, and hence to a large extent it was able to crowd out the wild oats.

Summary.

Summarizing the results of the experiments, superphosphate has been shown to be the most profitable form of manure to apply to wheat at Willaura. The experiments indicate that 2 cwt. of it per acre returns an average of 4s. 6d. per acre more than 1 cwt.—the dressing usually applied—i.e., the extra quantity pays for itself, and produces as well as the value of an extra bushel of wheat. It has also been shown that it pays to use an occasional dressing of lime.

In the local deposits of gypsum, Willaura farmers have an asset worth exploiting, especially for use on the stiff clays.

Basic phosphate, so widely advocated, is shown to be inferior to superphosphate under the conditions at Willaura.

Selected Federation has more than held its own with other standard varieties usually grown, such as Turvey. Gallipoli 58/1 appears to be worth sowing.

These plots have now been terminated, and it is proposed to transfer them to another location in the same district in order to test the stiffer textured soils.

BIRCHIP FALLOW COMPETITION.

Report of the Judge, L. C. Bartels, B.Agr.Sc., Chief Irrigation Field Officer.

In the Birchip district there are farmers who are applying up-to-date methods on their farms, and the best of the fallows inspected would bear comparison with the best seen in the Wimmera; but all the competition exhibits were not of the same high standard, and some of them showed that there is not a proper appreciation of the principles underlying fallowing.

It is safe to predict that the inauguration of a Crop and Fallow Competition by the Birchip Agricultural Society will be followed by a general raising of the standard of cultivation, simply because it will be demonstrated that there is a very direct relation between the cultural methods of good farmers and the high yields they obtain.

Very few farmers now question the value of fallow, and most of them are prepared to allow the land to lie bare for an extended period —even up to fifteen months—in preparation for a wheat crop which will occupy the land for six months. The evolution of the practice, which is now general in the wheat areas, may be traced in a generation from the time when a few enterprising farmers were persuaded to leave a small area to be ploughed in winter for the next year's crop. Not uncommonly, this land was left in the sod, and a fine crop of weeds developed. Little wonder then that full benefits were not obtained.

The wisdom of keeping fallows cultivated and free from weeds became apparent, and now it must be conceded that, with the application of improved cultural methods and systematic cultivation with the right implements, some of the fallows in the Wimmera come near in their condition to the best obtainable under practical limitations. The object aimed at in these fallows is to have the top 2½ inches in a loose condition, lying above a well-firmed bed, with the available moisture retained.

The results of good fallowing methods are moisture conservation, the elaboration of plant food, and the preparation of a suitable seed-bed. In addition, fallowing permits clean cultivation and the control of weeds, crop diseases, &c. Unless an endeavour be made to accomplish all these, the full value of the practice is not realized.

One exhibitor at Birchip was surprised to know that a compacted surface permitted the escape of moisture from the soil, and he considered his fallow to be in a very good condition, because there was not much weed growth.

In a well-drained soil, the moisture exists as films surrounding the soil particles. This moisture is held more or less tightly according to the thickness of these films, but there are forces at work endeavouring to equalize the moisture content of the soil throughout, and there is a constant movement from one film to another. The thin films exert a strong tension, and the movement is towards the places where the moisture content is lowest. When the surface of a compacted soil becomes dried through the agency of wind and warmth, there is a drain on the reserves of moisture in the soil, and thus from a neglected fallow the wastage of moisture goes on; but if the surface be stirred so that

contact between the soil particles is broken, obviously, the passage of moisture through the surface is prevented, and the moisture kept in until capillary union is established by setting.

Now, if conservation of moisture were the only consideration, a deep mulch would be most effective; but without a doubt it is the amount of available plant food, particularly nitrates, in the soil which governs the growth of a crop. Nitrates are built up by organisms, and for their development favorable conditions in regard to moisture, air and temperature, are required.

When effective cultivation has been practised, under normal conditions, the soil below the surface mulch is moist, friable, and easily moulded in the hand. The aim should be to keep as much moisture as possible in the surface soil below the mulch for the whole fallow period; hence the necessity for consolidating the seed-bed to re-establish capillary action after the ploughing. It may be understood from this why summer fallowing is superior to the old practice of late fallowing,

A Splendid Hay-shed on Mr. A. Barber's Farms.

and why, in the Wimmera, shallow ploughing and shallow cultivation have superseded the older methods.

There should be no need to emphasize the necessity of suppressing weeds. They will grow rapidly enough if the moisture is near the surface; but if they are not checked, they use up the moisture and nitrates which are stored in the soil. If allowed to seed, they will compete with the crop, and some are hosts for diseases which infect the wheat crop.

An endeavour should be made to turn under unburnt stubble to rot. Its presence in an unrotted condition retards nitrification, and it may be the means of carrying over disease spores from one wheat crop to another.

The soil in the Birchip district varies somewhat. The sandy loam of the Mallee preponderates, but in places it has a heavier texture, characteristic of Mallee fringe. Most of the land under cultivation is now well cleared of stumps. There is a danger of the surface soil being blown in wind storms, and this is advanced by some as a reason for

leaving the fallow in a rough condition; but it is safe to say that a well-tilled fallow presents less risk in that direction than a neglected fallow.

A description of the methods employed on the best fallow is given below.

My work in judging the fallow was made easy by the arrangements of Agricultural Society officials—Mr. P. Sexton, President; Mr. Lester, Secretary; and Messrs. Barber Bros., and I beg to express my thanks to them.

Mr. R. Gilmour exhibited two adjoining areas of fallow in the same paddock. Both had received similar treatment, and they presented the same appearance. The fallow was in good order, with a good mulch of the right depth and a firm seed-bed. A few weeds were noticed, and little rubbish lay on the surface. Horse hoof-marks in places were a blemish. The land bore a wheat crop in 1923, and the stubble was burnt in March, after which the area was spring-tooth

More Uses than One for a Motor-car (Mr. S. King's).

cultivated to a depth of 3½ inches. In May, the stump-jump scarifier (with 7-in. tynes) was put over the paddock, stirring it to a depth of 3½ inches. In July it was again spring-toothed to a similar depth. This was repeated in July, this time with the harrows following. In October and November, three workings with the spring-tooth cultivator and harrows attached were given. In spite of the frequent workings, a few weeds were left, and Mr. Gilmour considers that the scarifier would have given better results. The frequent spring rains made the working of the spring-tooth cultivator comparatively easy.

The better of Mr. R. Gillett's two entries of fallow was on the east side of an area of 200 acres. This land bore oats in 1923. It was ploughed in May with a six-furrow mouldboard plough to a depth of 3½ inches, and left till August, when it was spring-tooth cultivated 2½ inches deep. In September the stump-jump scarifier, fitted with broad tynes, was used to stir the soil to a depth of 2 inches. The land was spring-toothed lightly and harrowed towards the end of October, and in November harrowed. The appearance of

the fallow was good, although patches of weeds showed which portions had been grazed down by sheep. The mulch generally was of the right depth, and it overlay a good seed-bed—compact, but a little irregular in parts. Mr. Gillett uses either the spring-tooth cultivator or the scarifier, according to the condition of the ground. The spring-tooth is preferred if the land is free from weeds.

Hereunder is a list of points awarded to the various competitors:—

Competitor.	Moisture.	Mulch.	Absence of Weeds.	Cultivation.	Total.
Possible Points	**25**	**25**	**25**	**25**	**100**
R. Gilmour (A exhibit)	25	24	24	23	96
R. Gilmour (B exhibit)	25	24	24	23	96
R. Gillett (A exhibit)	25	23	23	24	95
F. J. King	25	23	24	23	95
R. Gillett (B exhibit)	25	23	22	22	92
H. P. Noonan	24	22	23	22	91
J. Rickard	24	22	22	23	91
S. King	24	22	22	22	90
W. O. Trigg (B exhibit)	24	21½	24	20	89½
W. O. Trigg (A exhibit)	24	20	22	21	87
A. Barber	23	21	22	20	86
W. Crosbie	22	15	23	15	75

NUMURKAH CROP AND FALLOW COMPETITION.

Report of the Judge, R. G. Thomas, B.Ag.Sc., Manager, Rutherglen State Farm.

The Numurkah Agricultural Society is to be congratulated on the number and general excellence of the crops submitted in its first crop and fallow competition. The report on the judging of the fallows emphasized the care with which these had been prepared, and in the majority of cases the resulting crops bore testimony to this. Crops generally were fairly heavy and free from undergrowth, though a rather too heavy sprinkling of wild oats showed in a large proportion. In a number of instances, however, crops suffered more or less heavily through the presence of diseases, flag smut being particularly prevalent. Loose smut and take-all were also present, the latter being bad in one or two cases; whilst several competitors lost points on account of the presence of ball smut. A few words on the treatment of these diseases may be opportune.

Flag Smut.

This appears as black streaks on the leaves, which, on examination, prove to be caused by black powder in the leaves, this being the seeds of a fungus growing as a parasite in the plant. The vitality of the plant is greatly reduced, sometimes to such an extent that no grain is borne. Some seasons the disease is very bad and greatly reduces yields. Practically all the crops entered in the competition showed some signs of the disease, and in some of them the amount of damage to the crops

was considerable. In combating the disease, the object which it is desired to achieve is the destruction of the seeds or spores of the fungus above referred to. A thorough burn-off of the stubble will destroy many of them. This should be followed by very thorough cultivation, ensuring that all unburnt stubble is turned in to rot, and that the soil is kept moist and mellow. This condition encourages the germination of the seeds of the fungus, and having no host plants in which to live, they are starved out. Where possible, a rotation of crops is also useful in suppressing the disease.

LOOSE SMUT.

This is evidenced by heads in which the grain is replaced by a mass of black powder or spores, which is in due course blown away, leaving the bare backbone. The disease cannot be controlled by any practicable method of pickling. Usually only a small percentage of the plants are affected, but should the disease become serious, a change of seed is advisable.

BALL SMUT.

Most farmers are on their guard against this disease, and practise the pickling of wheat in one or other of the prescribed solutions. If properly carried out, this procedure is very efficacious, and the presence of smut in any quantity, as was the case in one or two crops inspected, is usually accounted for by some irregularity in the method of pickling. Briefly, these methods are:—Bluestone, 1 to 1½ lb. to 10 gallons of water—pickle 3 to 5 minutes; Formalin, 1 lb. to 40-50 gallons of water —pickle 3 to 5 minutes. In both cases, it is essential that the seed be thoroughly immersed, and preferably poured into the solution, so that unbroken smut balls may rise to the surface and be skimmed off. A thorough stirring should also be given, and all additions to the solution should be made carefully and at the strength of the original mixture. Of the two solutions, bluestone is the more effective against re-infection. Farmers would be well advised, however, to investigate the merits of the process of dry pickling which is rapidly coming into vogue. This consists of dusting the seed with powdered copper carbonate at the rate of 2 oz. per bushel of seed. The method is most effective in all ways, particularly against re-infection, has no detrimental effect on germination, and can be done any length of time prior to seeding. Several satisfactory machines for its use are now on the market.

TAKE-ALL.

Take-all is always recognized when it has taken hold to such an extent that patches of crop are killed right out. Before this state of affairs is reached, however, it may appear as very small patches of affected crops, and if the plants are attacked late in the growing period, as "dead heads" or "white heads," when it is not always recognized. The yields of several crops inspected were very materially reduced by the presence of large numbers of "dead heads."

The disease can be definitely diagnosed by pulling up suspected plants and examining the roots and lower stalks. Roots are stunted and thickened, and on the stalks just above the uppermost roots will be found a more or less pronounced black marking, which may even show as an incrustation of black powder similar to that in flag smut. The methods recommended for the suppression of flag smut apply also to this disease, and, where practicable, a crop of oats should be grown

after the affected crop. Take-all appeared to be more prevalent in the lighter soils of the district than in the heavier ones; the former are probably more difficult to keep in the moist condition necessary to the germination and subsequent death of the spores. The crop most badly affected was grown on land which had been out to grass prior to fallowing. The explanation of this is that the fungus causing the disease can live on several of the grasses which are common in wheat country, and thus the disease is carried on. The fallacy of the practice of giving land affected with take-all a spell in grass is thus understood. On land which has been in pasture, and has been subject to the disease, it would probably prove beneficial to burn the grass prior to fallowing.

Results.

Mr. J. A. Tweddle secured first place with an award of 96 points for both the fallow and crop sections, giving the creditable aggregate of 192 points. Mr. D. Rendell was second in both sections and aggregate, receiving 92 points for crop, and 94 for fallow—total, 186. Mr. C. Gainey obtained third place with 91 marks for crop, and 90 for fallow—total, 181.

TABLE OF AWARDS.

For best 50 acres.—Fallow 1923, and Crop grown thereon 1924.

Competitor.	Yield.	Trueness to Type.	Absence of Weeds.	Absence of Disease.	Even-ness.	Total Crop.	Total Fallow.	Grand Total.
Possibe points ..	**35**	**20**	**15**	**15**	**15**	**100**	**100**	**200**
J. A. Tweddle ..	35	19	14	14	14	96	96	192
D. Rendell ..	32	19	14	13	14	92	94	186
C. Gainey ..	34	19	10	14	14	91	90	181
S. G. Poole ..	27	20	14	14	13	88	92	180
Hodge Bros., No. 2 Entry	33	18	9	13	13	86	92	178
P. A. Tweddle ..	33	18	12	14	12	89	87	176
R. Adams ..	32	18	14	9	14	87	85	172
Hodge Bros., No. 1 Entry	30	16	13	11	14	84	87	171
Hansen Bros. ..	28	18	10	13	12	81	90	171
J. A. Cowan ..	27	17	10	12	11	77	93	170
D. Cowan ..	29	16	10	12	11	78	91	169
G. Bedwell ..	25	19	12	13	11	81	83	164
T. McGrane, jnr.	26	17	11	11	13	78	85	163
W. Tyack ..	24	15	9	12	10	70	92	162
W. J. Thornton	25	18	8	11	9	71	90	161
F. Patten ..	26	16	10	11	13	76	83	159
J. S. Christie, jnr.	24	18	11	11	10	74	84	158
W. & T. Burgess	26	17	9	8	8	68	90	158
G. H. Close, jnr.	29	17	10	12	12	80	78	158

Mr. J. A. Tweddle's crop of Federation reflected the judicious cultivation which had been expended on the fallow. It was fairly heavy, very even and clean, contained only an odd stranger and a slight trace of loose and flag smuts. Cultivation was as follows:—Ground ploughed in June to a depth of 4½ to 5 inches, and harrowed immediately afterwards, and in August cross-harrowed. It was spring-toothed during the second week in September, and again the second

week in November; harrowed early in December; spring-toothed early in January and first week in March; and scarified first week in May. The last week in May it was scarified with the Wimmera type of scarifier, drilled, and harrowed. Seventy pounds of seed, bluestone-pickled, and 90 lb. of 22 per cent. superphosphate were sown.

Mr. D. Rendell's entry, also Federation, though somewhat lighter than Mr. Tweddle's, was a very creditable one. The crop was very even and clean, containing only an odd wild oat. Very few strangers were seen. A trace of both loose and flag smut was present, also a little take-all.

This land was previously in crop to oats, following which it was harrowed with weighted harrows in autumn to start the rubbish. In June and July it was ploughed, then harrowed twice in August, spring-tooth cultivated at the end of September, harrowed in October and early December—later in this month it was spring-toothed and harrowed; spring-toothed again early in March, and harrowed first week in April; cultivated with rigid tyne cultivator during the second week in May; sown with 80 lb. seed and 135 lb. superphosphate last week in May, and harrowed two weeks later. All workings, except the May cultivation, were made just after rain while the ground remained in nice working condition. This was probably one of the factors which helped to maintain the soil in the friable condition it showed at the time of crop judging, the surface being not in any way set down.

Mr. C. Gainey showed a heavy crop of Federation, somewhat rank in growth. It was practically free of strangers, but contained too many wild oats and some thistles. Loose and flag smuts were also present to a slight extent. Following the cultivation given up to time of judging the fallow, the land was spring-tooth cultivated early in April, spring-toothed across, drilled and harrowed at end of April. Fifty-five pounds of 22 per cent. superphosphate and 65 lb. of seed were sown.

Mr. S. G. Poole showed an attractive crop of Federation, very true to type, grown from Longerenong College seed. Cultivation after judging of fallow in March consisted of two scarifyings during April; it was then sown between 28th April and 8th May, and harrowed. Seventy pounds of seed and 70 lb. of 22 per cent. superphosphate were sown.

Messrs. Hodge Bros.' No. 2 entry contained areas of very heavy crop, but the average was lowered by patches of low-lying wet ground. It was fairly true to type, but contained a lot of wild oats and some thistles, including an odd saffron. A little smut (both loose and flag) was also present. This land was summer fallowed, cultivation in detail being as follows:—Disced in February after oats; ploughed with mould-board to 4 inches in August, and harrowed twice; disc-cultivated early in October, and harrowed in November; cultivated with rigid-tyned cultivator in January; harrowed in February; cultivated with rigid-tyne cultivator in March, and again in April; disc-cultivated and harrowed last week in May; drilled first week in June with 90 lb. seed and 1 cwt. of 22 per cent. superphosphate.

Other creditable entries were those of Messrs. P. A. Tweddle and R. Adams, and Hodge Bros.' No. 1 entry. Mr. Adams lost heavily on account of the presence of ball (stinking) smut.

WILLAURA CROP AND FALLOW COMPETITIONS, 1924.

Report of Judge, P. D. McRae, Field Officer.

These competitions comprised three sections—(*a*) 50 acres of wheat grown on fallow; (*b*) 25 acres of wheat grown by returned soldiers, and (*c*) 50 acres of fallow.

In the following tables are given the points awarded the respective competitors in the several sections:—

Details of Awards.

SECTION (*a*): 50 ACRES OF WHEAT GROWN ON FALLOW.

Name.	Yield.	Trueness to Type.	Absence of Weeds.	Absence of Disease.	Evenness.	Total.
Possible Points	**35**	**20**	**15**	**15**	**15**	**100**
James Shalders (1)	34	19	14	13	15	95
E. Heard (1)	34	19	13	14	14	94
E. Heard (2)	35	19	13	12	14	93
L. J. O'Rorke	35	15	14	14	15	93
H. Gordon	34	16	13	13	14	90
James Heard	33	19	12	13	13	90
C. Sutterby	29	19	15	13	12	88
James Shalders (2)	32	16	13	13	12	86
F. T. Stevens	32	16	13	10	14	85
E. Ray Hargreaves	30	18	12	13	12	85
Herbert G. Payne	28	18	13	12	12	83
C. Wynne	28	18	10	13	12	81
Bygrave & Thornton	22	18	13	13	11	77
Robert J. Gurney	22	17	13	10	12	74
C. A. Seadon	23	15	12	12	12	74
R. S. Ferguson	19	15	14	12	12	72
Eric O. G. Byron	17	18	10	13	10	68
J. H. Austin	16	10	10	12	10	58

SECTION (*b*): 25 ACRES OF WHEAT GROWN BY RETURNED SOLDIERS.

Name.	Yield.	Trueness to Type.	Absence of Weeds.	Absence of Disease.	Evenness.	Total.
Possible Points	**35**	**20**	**15**	**15**	**15**	**100**
E. Ray Hargreaves	35	18	14	13	13	93
C. A. Seadon	33	19	14	10	13	89
Robert J. Gurney	30	19	14	10	13	86
R. S. Ferguson	28	17	13	12	13	83
Geo. Jarry	28	15	14	10	13	80
Bygrave & Thornton	24	18	13	13	11	79
J. N. Victor Byron	33	10	10	12	14	79

SECTION (*c*) : 50 ACRES OF FALLOW.

Name.	Mulch.	Moisture.	Weeds.	Cultivation.	Total.
Possible Points	25	25	25	25	100
G. Dickeson	23	21	23	23	90
H. P. Gellert	23	23	20	20	86
G. B. Gellert	20	18	23	20	81
P. W. Nicholson	20	20	22	18	80
C. Wynne	15	20	18	15	68
Bygrave & Thornton	12	15	12	15	54

Section (a).—50 Acres of Wheat Grown on Fallow.

The crops shown in this section were on the whole very fine, being well grown, well headed, and fairly even. The varieties most favored were Federation and Turvey, eight crops of each being shown, while there were only two of Major and one of Crossbred 12.

It will be seen that Mr. James Shalders secured first place with 95 points, Mr. E. Heard following closely with 94 points for his No. 1 entry, and with his No. 2 entry being level with Mr. L. J. O'Rorke for third place.

The winning crop was a fine one, being very even, containing practically no loose smut, and very little take all. It was perfectly clean, except for an odd thistle, and there were very few plants of foreign varieties present.

Mr. E. Heard's No. 1 entry was a remarkably fine crop, and contained comparatively little smut, a few foreign heads and thistles, and a little undergrowth. No. 2 entry was also a splendid crop, with no undergrowth, but a good many thistles, a little smut and take all.

Mr. L. J. O'Rorke's crop of Federation should have been higher in the competition, but, unfortunately, it contained a good many "strangers." There were a very few thistles, a few wild oats, and a little loose smut.

Mr. H. Gordon's crop was also very heavy, but there were present a fair number of foreign heads, odd thistles, and wild oats, and a little smut.

Mr. James Heard's crop of Turvey was one which, although slightly uneven in patches, and showing a little barley, thistles, and undergrowth, was yet very heavy.

Section (b).—25 Acres of Wheat Grown by Returned Soldiers.

Some remarkably good crops were shown in this section, and the winning crop, that of Mr. E. Ray Hargreaves, was one of which any man might justly be proud. It was heavy, even, almost entirely free from weeds, with only a very little smut and a few foreign heads. This result was achieved, not by accident, but as the result of thorough and efficient husbandry.

Mr. Seadon's crop was also an excellent one, heavy and tall, free from weeds and true to type, but smut was very prevalent, and there was also a good deal of "take all."

Mr. Gurney's Turvey was also good, but slightly uneven on account of crab holes; it was pure and free from weeds, but much wheat had been lost through loose smut.

Section (c).—50 Acres of Fallow.

The highest points in this section were gained by Mr. G. Dickeson, portion of whose fallow, having been recently worked, was in very fair condition, the balance not being quite so good. On the whole it was fairly free from weeds, with a good mulch, which had a level bottom, showing that the implements had worked at a regular depth. Owing to the looseness of the mulch, the subsoil showed a fair moisture content. The soil, being a sandy loam, was, perhaps, easier to handle than the bulk of the soil in the district.

Mr. H. P. Gellert's exhibit had a very loose mulch, but it was so deep that there was very little consolidation of the sub-surface soil. The moisture content was good, but there were a fair number of thistles and a good deal of sorrel.

The exhibits in this section were, generally speaking, not very high examples of the art of fallowing. Owing to the wet season most of the fallows shown had very little cultivation, and had, therefore, set hard on the surface, and were growing far too many weeds.

By fallowing, the land is first loosened so as to make easy the passage of rain water into the soil, and then by working the surface frequently the escape of moisture into the air is prevented. Convincing proof that such action takes place under field conditions can be furnished by comparing the subsoil of a neglected fallow in which the surface has become hard, with one in which the surface mulch has been well maintained. In the first case the land will be found to be hard and dry, whilst in the other it will be moist and mellow, and in a fit condition to maintain the teeming millions of bacteria which live in the soil and exert a tremendous influence on its fertility.

Care should be taken to avoid working clay loams, such as are found in the Willaura district, into too fine a condition on the surface, because, in that case, should a heavy fall of rain occur, the land will puddle, and when it dries will set like cement. Cracks will then appear, through which the moisture rapidly escapes, and in a few days the soil will be drier than it was before the rain.

While some crops, such as maize, like a deep, open soil, wheat thrives best in a firm and rather compact seed bed, so that the surface mulch should be only deep enough to hold the moisture. In order to obtain best results, implements should be set to work at a regular depth. It is quite easy to have one side of a wide implement cutting a couple of inches deeper than the other. More economical, efficient, and satisfactory work will be done when the implement is working level, and when, by straight driving, the whole of the ground is being covered. Weeds rob the crop of moisture and plant food, and should not be tolerated in a fallow.

An ideal fallow for wheat growing then should have a loose and, perhaps, somewhat lumpy mulch not more than 2 inches in depth, the soil below being well compacted and holding much moisture. The land should be level and free from weeds

General Remarks.

The weight of seed used for the respective crops varied from 70 to 90 lb. One of the heaviest crops, that of Mr. ORorke, was produced from 70 lb. of seed, while the heavier amount was used on some of the lighter crops. On a majority of the heavier crops the quantity used was 80 lb., which, probably, is about the correct amount.

With regard to the amount of fertilizer used, several of the heavier crops received an application of the equivalent of 160 lb. of 18 per cent. superphosphate, while only one of the lighter crops received more than 130 lb. At the same time Mr. E. Heard used only 126 lb., and Mr. James Heard 130 lb. in securing heavy yields.

So far as concerns time of ploughing and working the land, there can be no doubt that the earlier these operations are performed the greater are the prospects of securing a heavy crop. Out of the leading seven crops in the open competition five were grown on land ploughed during or before August, and had been cultivated at least once by the month of November. On the other hand, without any exceptions whatever, those who showed the lighter crops failed to work their land after ploughing before February or March. In this connexion Mr. O'Rorke's crop is noteworthy. It was grown on land which had been in cultivation for a number of years and would, by most farmers in the district, have been considered long overdue for a spell. By means, however, of early and continued cultivation Mr. O'Rorke has grown successful crops, and this year was able to show one of the heaviest and finest crops in the district. For the present crop he ploughed 4 to 5 inches in August, harrowed twice in September, spring toothed in October, again in November, in December, and in February, skim ploughed 3 to 3½ inches in April, and drilled in May with 70 lb. of Federation wheat and 130 lb. of 22 per cent. superphosphates. Such a method leaves nothing to chance and ensures a good crop under the worst of conditions.

One of the greatest defects noticed in the crops was a prevalence of loose smut. Every crop examined was more or less affected, and in the worst cases the loss suffered must have been at least one-quarter to one-third of the whole, while the aggregate of the district must have been enormous.

Loose smut must be distinguished from stinking smut or bunt; in the latter disease the spores from which it develops cling to the outside of the wheat grain and are thus in a position to be easily attacked and killed by pickling. In the case of loose smut the spores enter the flower and are enclosed by the seed as it develops, and they cannot be affected by ordinary methods of pickling. The best treatment so far discovered —known as the Jensen method—consists in standing the seed in water at a temperature of 130 to 135 degrees for from 5 to 8 minutes. As this temperature is fraught with considerable danger to the seed, the treatment is not recommended for general use.

"Take all" was also present in a good many crops, and on some it had made serious inroads. A practical method of dealing with this disease is to destroy the spores by burning the stubble, ploughing in what remains in order that it may rot, and thereafter to starve out the fungus by keeping the land free from any plant which would act as a host; in other words, to keep the fallow free from weeds, and, if possible, to grow an oat crop on the ground before again growing wheat.

BURNLEY EGG-LAYING COMPETITION.

Report for the Year 1924-25.

By W. C. Rugg, Poultry Expert.

The fourteenth Egg-laying Competition, which was commenced on the 1st April, 1924, was concluded on the 31st March, 1925.

Mr. H. J. Hulme's Black Orpingtons—Winners of Class 3, Section A, with 1,589 eggs for twelve months.

Messrs. A. R. Boothman & Son's Langshans—Winners of Class 6, Section A, with 1,328 eggs for 12 months.

Owing to the very unseasonable weather experienced at the commencement of the Competition, more pullets went into a false moult than has ever happened before at a Burnley Competition, and this explains

why so many of them did not lay for the first six or eight weeks of the test. Over 40 per cent. of the Leghorns, and nearly 50 of the

Mr. J. J. Condon's White Leghorns—Winners of Dry Mash Class, with 1,476 eggs for twelve months.

Mr. J. J. Hooper's White Leghorns—Winners of Wet Mash Class with 1,372 eggs for twelve months.

Black Orpingtons moulted during the first few weeks, and one consequence was that not so many high scores were recorded as was the case

Mr. F. G. Julyan's Black Orpington—Winner of Class 4, Section B, with 289 eggs for twelve months.

Messrs. McCormack & Kinzel's Rhode Island Reds—Winners of Class 9, Section A, with 1,228 eggs for twelve months.

last year. Some of the competitors were particularly unfortunate in this respect. In Section A, Class 1, Mr. Langley had three birds in his team moult. The Ceres Stud all moulted, and in Mr. A. J. Hill's team four moulted and then laid 1,410 eggs, finishing in third place. Several other competitors had two or more that moulted. In Section A, Class 2, of the teams owned by Messrs. Herbert Bros., Mr. J. G. Alston, and Mr. L. F. Bush, all the birds moulted, while in several other teams there were two or more that moulted.

Mr. J. Walker's White Leghorn—Winner of Wet Mash Class, Single Test, with 306 eggs for twelve months.

Though the average number of eggs laid was lower this year than last, it is slightly higher than the average for the 1922-23 Competition, and taking into consideration the unsettled weather during most of the year, the scores made must be considered satisfactory.

Under the rule relating to the size of eggs four birds were disqualified. This rule reads, "Any bird whose eggs during the month of July do not attain an average weight of at least two ounces will be disqualified." On pages 356-7 there is printed a table showing the average weight per dozen of all eggs laid by each team in the four classes of Section A.

Mr. Norman Myers' White Leghorn—Winner in Dry Mash Class, Single Test, with 303 eggs for twelve months.

Mr. S. C. Handley's Sicilian Buttercup—Winner of Class 3, Section B, with 234 eggs for twelve months.

THE FINANCIAL SIDE.

The total number of eggs laid by the 619 birds that finished in the Competition was 129,366—a fraction under 209 eggs per bird.

The price realized for eggs averaged 1s. 9¼d. per dozen.

The cost of food averaged, approximately, 2½d. per bird per week.

The return from sales of eggs averaged £1 10s. 10d. per bird for the year; and the cost of feed averaged 10s. 8d. per bird; thus, the profit over cost of food for the year averaged £1 0s. 2d. per bird.

A list of the different kinds and quantities of the food fed to the birds during the currency of the competition is given hereunder:—

Wheat, 496½ bushels; oats, 98½ bushels; maize, 40½ bushels; bran, 737½ bushels; pollard, 999½ bushels; pea meal, 37 lb.; grit, 2 tons; charcoal, 2 bags; onions, 239 lb.; meat meal, 278 lb.; meat, 2,657 lb. (bullocks' heads).

The total cost of feed was £329 16s. 5d.

Mr. H. Miller's Black Minorcas—Winners of Class 5, Section A, with 1,035 eggs for twelve months.

The 1925-26 Competition.

CHANGE IN METHOD OF CHOOSING WINNERS.

In all the Burnley Competitions held so far the winning birds were those laying the greatest total number of eggs, but this system of choosing the winners has now been discarded. In view of the rapid growth of the poultry industry, it has been thought well to alter the rule relating to the allotment of winning certificates, and it has been decided that this year's competitions will be decided by the market value of the eggs laid by the competing birds. Every egg will be weighed, and first grade eggs, weighing 2 oz. and over, are to be valued at top market price; second grade eggs, weighing under 2 oz. but over 1¾ oz., are to be valued at 25 per cent. less than first grade, while eggs weighing less than 1¾ oz. will not be valued.

At the termination of the Competition, each owner will know the weight of eggs laid by individual members of his team. It is hoped that by breeding only from birds that have been proved to lay standard-weight eggs and by the distribution of their stock that an increase in the size of eggs will be attained. This is absolutely necessary if we are to establish a profitable export trade.

PRIZE LIST.

FOURTEENTH EGG-LAYING COMPETITION, 1924–25, CONDUCTED AT THE BURNLEY SCHOOL OF PRIMARY AGRICULTURE AND HORTICULTURE.

For the greatest total number of eggs laid by a pen in each Class of Sections "A" and "B":—

Section A.—Groups of Six Birds.—Trapnested.

Class 1.—Leghorns.—Wet Mash.

1st Prize, Champion Certificate .. J. J. Hooper, Wonga Park, Croydon (1,372 eggs).
2nd Prize, Government Certificate .. Mrs. T. Wilson, "Lanark," 7 Murray-street, Brunswick West (1,358 eggs).
3rd Prize, Government Certificate .. John Clamp, "Camp Hill" Poultry Farm, Rosanna (1,355 eggs).

Class 2.—Leghorns.—Dry Mash.

1st Prize, Champion Certificate .. J. J. Condon, Point Nepean-road, Carrum (1,476 eggs).
2nd Prize, Government Certificate .. R. R. W. Brown, P.O., Metropolitan Farm, Werribee (1,468 eggs).
3rd Prize, Government Certificate .. A. J. Hill, "Sunraysia" Poultry Farm, Greensborough (1,410 eggs).

Class 3.—Orpingtons.—Wet Mash.

1st Prize, Champion Certificate .. H. J. Hulme, Bobinawarrah, via Wangaratta (1,589 eggs).
2nd Prize, Government Certificate .. Marville Poultry Farm (A. H. Dumaresq), South-road, Moorabbin (1,438 eggs).
3rd Prize, Government Certificate .. W. Cullen, Werribee Poultry Farm, Werribee (1,418 eggs).

Class 4.—Anconas.—Wet Mash.

1st Prize, Champion Certificate .. Geo. Petterd, 130 Severn-street, Box Hill (757 eggs).

Class 5.—Black Minorcas.—Wet Mash.

1st Prize, Champion Certificate .. H. Miller, 64 Childers-street, Kew (1,085 eggs).

Class 6.—Langshans.—Wet Mash.

1st Prize, Champion Certificate .. A. R. Boothman and Son, 17 Belgrave-street, Auburn (1,328 eggs).
2nd Prize, Government Certificate .. R. Cooper, Port Albert Hotel, Port Albert (1,170 eggs).
3rd Prize, Government Certificate .. A. Siede, 97 Stawell-street, Richmond (1,005 eggs).

Class 7.—White Wyandottes.—Wet Mash.

1st Prize, Champion Certificate .. C. B. Bertelsmeier, Kensington, S.A. (932 eggs).

Class 9.—Rhode Island Reds.—Wet Mash.

1st Prize, Champion Certificate .. McCormack and Kinzel, 5 Wigton-street, Ascot Vale (1,228 eggs).
2nd Prize, Government Certificate .. F. H. King, Ballarat East (1,114 eggs).
3rd Prize, Government Certificate .. W. E. Donovan, 24 Regent-street, Middle Brighton (960 eggs).

Section B.—Individual Birds.—Single Test.

Class 1.—Leghorns.—Wet Mash.

1st Prize, Champion Certificate .. J. Walker, 128 Moran-street, Bendigo (306 eggs).
2nd Prize, Government Certificate .. Mrs. A. Oxley, Wood-street, Newport (300 eggs).
3rd Prize, Government Certificate .. Mrs. T. Wilson, "Lanark," 7 Murray-street, Brunswick West (296 eggs).

Class 2.—Leghorns.—Dry Mash.

1st Prize, Champion Certificate .. Norman Meyers, 48 Queen's-avenue, Caulfield (303 eggs).
2nd Prize, Government Certificate .. W. Cook, Point Nepean-road, Carrum (301 eggs).
3rd Prize, Government Certificate .. Claud Langley, Kidd's-road, Dandenong (280 eggs).

Class 3.—All Light Breeds, other than Leghorns, Anconas, and Minorcas.—Wet Mash.

1st Prize, Champion Certificate .. S. C. Handley, Box 14, Dandenong (234 eggs).
2nd Prize, Government Certificate .. S. C. Handley, Box 14, Dandenong (197 eggs).

Class 4.—Orpingtons, any colour.—Wet Mash.

1st Prize, Champion Certificate .. F. G. Julyan, Mont Rose Poultry Farm, 496 Point Nepean-road, North Brighton (289 eggs).
2nd Prize, Government Certificate .. Roy Sanders, Hagelthorn-street, Wonthaggi (280 eggs).
3rd Prize, Government Certificate .. Mrs. N. Pearson, Quarrie Cottage, 108 Ramsden-street, Clifton Hill (277 eggs).

For the greatest total number of eggs laid by individual birds in each Class of Section "A":—

Class 1.—Leghorns.—Wet Mash.

1st Prize, Champion Certificate .. L. F. Bush, Westall-road, Springvale (289 eggs).
2nd Prize, Government Certificate .. *John Clamp, "Camp Hill" Poultry Farm, Rosanna (270 eggs).
*D. Gibson, 126 Dundas-street, Thornbury (270 eggs).

* Equal for second place.

Class 2.—Leghorns.—Dry Mash.

1st Prize, Champion Certificate .. J. J. Condon, Point Nepean-road, Carrum (280 eggs).
2nd Prize, Government Certificate .. Claud Langley, Kidd's-road, Dandenong (272 eggs).
3rd Prize, Government Certificate .. *A. Enticknap, 266 High-street, Windsor (269 eggs).
*N. Burston, 284 Glenferrie-road, Glenferrie (269 eggs).

* Equal for third place.

Class 3.—Orpingtons.—Wet Mash.

1st Prize, Champion Certificate .. H. J. Hulme, Bobinawarrah, via Wangaratta (300 eggs).
2nd Prize, Government Certificate .. H. J. Hulme, Bobinawarrah, via Wangaratta (276 eggs).
3rd Prize, Government Certificate .. C. E. Graham, "All Black" Poultry Farm, Portarlington (270 eggs).

Class 4.—Anconas.—Wet Mash.

1st Prize, Champion Certificate .. Geo. Petterd, 130 Severn-street, Box Hill (204 eggs).
2nd Prize, Government Certificate .. Geo. Petterd, 130 Severn-street, Box Hill (169 eggs).
3rd Prize, Government Certificate .. Geo. Petterd, 130 Severn-street, Box Hill (146 eggs).

Class 5.—Black Minorcas.—Wet Mash.

1st Prize, Champion Certificate .. H. Miller, 64 Childers-street, Kew (217 eggs).
2nd Prize, Government Certificate .. H. Miller, 64 Childers-street, Kew (194 eggs). (Nos. 1 and 5 equal 2nd).

Class 6.—Langshans.—Wet Mash.

1st Prize, Champion Certificate .. A. R. Boothman and Son, 17 Belgrave-street, Auburn (260 eggs).
2nd Prize, Government Certificate .. A. R. Boothman and Son, 17 Belgrave-street, Auburn (256 eggs).
3rd Prize, Government Certificate .. R. Cooper, Port Albert Hotel, Port Albert (233 eggs).

Class 7.—White Wyandottes.—Wet Mash.

1st Prize, Champion Certificate .. C. B. Bertelsmeier, Kensington, S.A. (236 eggs).
2nd Prize, Government Certificate .. C. B. Bertelsmeier, Kensington, S.A. (205 eggs).
3rd Prize, Government Certificate .. C. B. Bertelsmeier, Kensington, S.A. (169 eggs).

Class 9.—Rhode Island Reds.—Wet Mash.

1st Prize, Champion Certificate .. McCormack and Kinzel, 5 Wigton-street, Ascot Vale (229 eggs).
2nd Prize, Government Certificate .. F. H. King, Ballarat East (223 eggs).
3rd Prize, Government Certificate .. *McCormack and Kinzel, Ascot Vale (214 eggs).
*L. Faulkner, 6 Normanby-street, Moonee Ponds (214 eggs).

* Equal for Third Place.

For the pen which shows the greatest average weight per dozen eggs laid:—

Section A.—Groups of Six Birds.—Trapnested.

1st Prize, Government Certificate .. A. R. Boothman and Son, 17 Belgrave-street, Auburn (25.349 oz. per dozen).

For the pen the eggs of which realized the highest market value throughout the competition:—

Section A.—Groups of Six Birds.—Trapnested.

1st Prize, Government Certificate .. H. J. Hulme, Bobinawarrah, via Wangaratta (1,589 eggs, value £11 14s. 5¾d.).

WEIGHT OF EGGS.

From 1st July, 1924, to 31st March, 1925.

Pen No.	Name.	No. of Eggs.	Weight of Eggs.	Average Weight of Egg.	Average Weight per dozen.
			oz.	oz.	oz.
	Class 1.—Leghorns.—Wet Mash.				
1	L. F. Bush	1,040	2,130·5	2·048	24·582
2	C. C. Dunn	1,075	2,183·5	2·031	24·373
3	Herbert Bros.	968	1,966·5	2·031	24·378
4	E. and D. O'Mullane	1,006	2,068	2·055	24·667
5	W. Coats	1,057	2,171·5	2·054	24·652
6	Echuca Poultry Farm	1,068	2,201	2·060	24·730
7	H. J. Bradshaw	1,023	2,073·5	2·026	24·322
8	W. Cullen	959	1,957	2·040	24·487
9	A. J. Hill	1,060	2,188	2·064	24·769
10	J. G. Alston	1,062	2,151·5	2·025	24·310
11	G. McCutchan	1,068	2,209·5	2·068	24·825
12	J. J. Hooper	1,164	2,386	2·049	24·597
13	R. R. W. Brown	1,108	2,248	2·028	24·346
14	Rod Jeffrey	1,057	2,149·5	2·033	24·402
15	H. Groves	963	1,938·5	2·012	24·155
16	W. E. C. O'Neill	1,024	2,084	2·035	24·421
17	W. M. Percy	1,015	2,060	2·029	24·354
18	John Clamp	1,145	2,338	2·041	24·503
19	T. J. Culhane	879	1,777·5	2·022	24·264
20	Orana Poultry Farm	1,018	2,071·5	2·034	24·418
21	M. G. Leech	980	1,990	2·030	24·367
22	Claud Langley	1,042	2,124·5	2·038	24·466
23	H. Schmutter	950	1,933	2·034	24·416
24	H. Shaw	929	2,093	2·252	27·035
25	D. Gibson	953	1,925·5	2·020	24·245
26	G. Pocknall	900	1,819	2·021	24·253
27	A. Thomas	963	1,943	2·017	24·211
28	Mrs. T. Wilson	1,165	2,358·5	2·024	24·293
29	F. Wight	943	1,932·5	2·049	24·591
	Class 2.—Leghorns.—Dry Mash				
30	A. R. Boothman and Son	1,017	2,130	2·094	25·132
31	O. H. Gepp	1,103	2,265·5	2·053	24·647
32	J. J. Condon	1,204	2,481	2·060	24·727
33	G. F. Walbran	1,168	2,379·5	2·037	24·446
34	A. Enticknap	1,161	2,340	2·015	24·186
35	Braeside Poultry Farm	844	1,748·5	2·071	24·861
36	Claud Langley	1,106	2,263·5	2·046	24·558
37	J. Wear	933	1,913·5	2·050	24·610
38	R. R. W. Brown	1,186	2,431	2·049	24·596
39	Norman Meyers	1,021	2,126	2·082	24·987
40	A. J. Hill	1,211	2,514	2·075	24·911
41	N. Burston	1,017	2,072	2·037	24·448
42	Ceres Stud	1,108	2,336	2·108	25·299

Weight of Eggs—*continued.*

Pen No.	Name.	No. of Eggs.	Weight of Eggs.	Average Weight of Egg.	Average Weight per dozen.
			oz.	oz.	oz.
	Class 3.—Orpingtons.—Wet Mash.				
43	R. R. Christie	1,079	2,168	2·009	24·111
44	Wingood Poultry Yard	1,041	2,197·5	2·110	25·331
45	G. F. Farrar	883	1,783·5	2·019	24·238
46	Marville Poultry Farm	1,056	2,113	2·000	24·011
47	J. Wear	845	1,740	2·059	24·710
48	C. B. Bertelsmeier	901	1,827	2·027	24·332
49	Orana Poultry Farm	811	1,641	2·023	24·281
50	H. J. Hulme	1,356	2,711	1·999	23·991
51	C. C. Dunn	998	2,065	2·069	24·829
52	W. Cullen	1,122	2,263	2·016	24·203
53	C. E. Graham	1,041	2,162	2·076	24·922
54	Herbert Bros.	1,120	2,263·5	2·020	24·251
55	A. R. Boothman and Son ..	839	1,697·5	2·023	24·278
56	T. L. Eastaugh	958	1,966	2·052	24·626
57	W. K. Grady	825	1,670·5	2·024	24·298
	Class 4.—Anconas.—Wet Mash.				
58	Geo. Petterd	705	1,411	2·001	24·016
	Class 5.—Black Minorcas.—Wet Mash.				
59	H. Miller	1,009	2,117	2·098	25·177
	Class 6.—Langshans.—Wet Mash.				
60	R. Cooper	1,108	2,358·5	2·128	25·543
61	Harry Dibbs	899	1,931	2·147	25·775
62	A. R. Boothman and Son ..	1,138	2,404	2·112	25·349
63	A. Siede	850	1,806·5	2·125	25·503
	Class 7.—White Wyandottes.—Wet Mash.				
64	C. B. Bertelsmeier	807	1,629	2·018	24·222
	Class 9.—Rhode Island Reds.—Wet Mash.				
65	C. H. Jenkin	588	1,316·5	2·238	26·867
67	F. H. King	933	1,950	2·090	25·080
68	McCormack and Kinzel	1,019	2,135·5	2·095	25·148
69	W. E. Donovan	833	1,745·5	2·095	25·145
70	L. Faulkner	595	1,311	2·203	26·440

FINAL RESULTS

(Eggs laid outside of nest denoted thus (x); death of birds indicated thus (*d*).

Section A.—Groups of Six Birds.—Trapnested.

Pen No.	Competitor.	Hens.							Total to 31st March, 1925.
		1.	2.	3.	4.	5.	6.	(x).	
	Class 1.—Leghorns, Wet Mash (White Leghorns).								
12	J. J. Hooper ..	233	229	231	224	217	238	..	1,372
28	Mrs. T. Wilson ..	262	201	268	198	241	188	..	1,358
18	John Clamp ..	270	224	251	194	199	215	2	1,355
25	D. Gibson ..	191	(*d*) 98	270	240	218	261	..	1,278
13	R. R. W. Brown ..	215	257	171	192	201	218	..	1,254
2	C. C. Dunn ..	265	236	205	213	(*d*) 148	172	2	1,241
5	W. Coats ..	209	167	220	175	253	211	..	1,235
16	W. E. C. O'Neill ..	219	243	174	222	216	157	2	1,233
27	A. Thomas ..	170	231	228	168	192	234	1	1,224
22	Claud Langley ..	178	224	227	185	239	170	1	1,224
11	G. McCutchan ..	197	211	222	208	204	178	..	1,220
26	G. Pocknall ..	175	172	231	217	212	198	1	1,206
1	L. F. Bush ..	168	196	175	289	168	206	2	1,204
17	W. M. Percy ..	212	180	184	205	227	193	1	1,202
10	J. G. Alston ..	214	221	148	173	234	200	1	1,191
20	Orana Poultry Farm	215	234	197	174	161	208	..	1,189
8	W. Cullen ..	178	(*d*) 146	240	195	190	219	..	1,168
4	E. and D. O'Mullane	222	213	208	194	122	207	1	1,167
21	M. G. Leech ..	211	175	190	166	235	179	..	1,156
14	Rod. Jeffrey ..	191	173	221	159	220	188	..	1,152
29	F. Wight ..	157	207	221	121	227	212	..	1,145
23	H. Schmutter ..	238	237	55	204	190	221	..	1,145
9	A. J. Hill ..	152	182	187	231	196	159	2	1,109
6	Echuca Poultry Farm ..	189	201	202	168	165	166	5	1,096
19	T. J. Culhane ..	236	163	218	203	100	159	1	1,080
7	H. J. Bradshaw ..	(*d*) 152	178	224	139	194	185	1	1,073
15	H. Groves ..	160	207	183	215	133	166	3	1,067
3	Herbert Bros. ..	192	186	182	153	204	143	3	1,063
24	H. Shaw ..	204	214	211	131	144	109	..	1,013
	Class 2.—Leghorns, Dry Mash (White Leghorns).								
32	J. J. Condon ..	227	237	249	240	280	242	1	1,476
38	R. R. W. Brown ..	265	202	240	254	260	246	1	1,468
40	A. J. Hill ..	261	261	227	234	213	213	1	1,410
36	Claud Langley ..	254	251	248	272	197	167	1	1,390
31	O. H. Gepp ..	255	239	214	229	232	195	3	1,367
34	A. Enticknap ..	269	141	229	245	253	212	4	1,353
39	Norman Meyers ..	(*d*) 157	226	244	238	228	226	..	1,319
33	G. F. Walbran ..	219	212	221	209	192	227	3	1,283
41	N. Burston ..	235	269	(*d*) 108	205	(*d*) 191	232	1	1,241
42	Ceres Stud ..	193	215	190	202	237	186	3	1,226
30	A. R. Boothman and Son ..	204	185	204	207	231	154	..	1,185
37	J. Wear	217	231	(*d*) 19	234	253	227	2	1,183
35	Braeside Poultry Farm ..	211	215	206	135	188	(*d*) 38	2	995

FINAL RESULTS—*continued.*

SECTION A.—GROUPS OF SIX BIRDS—TRAPNESTED—*continued.*

Pen No.	Competitor.	Hens. 1.	2.	3.	4.	5.	6.	(x).	Total to 31st March, 1925.
Class 3.—Orpingtons, Wet Mash (Black Orpingtons).									
50	H. J. Hulme ..	300	276	262	246	249	247	9	1,589
46	Marville Poultry Farm ..	224	247	214	267	229	255	2	1,438
52	W. Cullen ..	250	249	243	217	229	230	..	1,418
44	Wingood Poultry Yard ..	224	193	243	238	181	239	..	1,318
54	Herbert Bros. ..	253	247	171	233	240	153	1	1,298
43	R. R. Christie ..	217	145	246	241	231	209	2	1,291
51	C. C. Dunn ..	174	243	155	216	232	210	..	1,230
53	C. E. Graham ..	270	220	176	175	180	165	4	1,190
56	T. L. Eastaugh ..	216	228	102	226	215	182	..	1,169
45	G. F. Farrar ..	199	128	109	238	212	260	4	1,150
47	J. Wear.. ..	168	172	(*d*) 149	249	170	217	1	1,126
48	C. B. Bertelsmeier	220	184	167	198	127	160	4	1,060
49	Orana Poultry Farm	177	176	187	171	190	(*d*) 153	2	1,056
55	A. R. Boothman and Son ..	186	197	164	156	208	101	2	1,014
57	W. K. Grady ..	105	196	197	196	209	96	3	1,002
Class 4.—Anconas.—Wet Mash.									
58	Geo. Petterd ..	169	146	204	101	84	(*d*) 49	4	757
Class 5.—Black Minorcas.—Wet Mash.									
59	H. Miller ..	194	179	177	217	194	124	..	1,085
Class 6.—Langshans.—Wet Mash.									
62	A. R. Boothman and Son ..	232	186	260	181	206	256	7	1,328
60	R. Cooper ..	233	211	168	149	213	195	1	1,170
63	A. Siede ..	198	175	152	185	231	(*d*) 63	1	1,005
61	Harry Dibbs ..	161	229	128	209	115	83	4	929
Class 7.—White Wyandottes.—Wet Mash.									
64	C. B. Bertelsmeier	236	205	154	169	105	(*d*) 58	5	932
Class 9.—Rhode Island Reds.—Wet Mash.									
68	McCormack and Kinzell ..	214	177	210	229	194	196	8	1,228
67	F. H. King ..	(*d*) 167	189	163	223	160	212	..	1,114
69	W. E. Donovan ..	147	180	177	137	148	169	2	960
65	C. H. Jenkin ..	123	92	139	(*d*) 77	130	93	4	658
70	L. Faulkner ..	(*d*)	214	106	116	127	79	4	646

FINAL RESULTS—*continued.*

Section B.—Individual Birds, Single Test.

Pen No.	Competitor.	Total to 31st March, 1925.	Pen No.	Competitor.	Total to 31st March, 1925.
Class 1.—Leghorns, Wet Mash (White Leghorns except Pens 227 and 228 Brown Leghorns).					
141	J. Walker	306	167	H. R. McChesney	231
143	Mrs. A. Oxley	300	160	J. J. Hooper	231
203	Mrs. T. Wilson	296	224	C. H. Jenkin	230
162	J. H. Nichols	294	206	A. Reynolds	230
202	Solway Poultry Farm	286	148	G. Dwyer	230
192	P. N. Tilley	282	211	Mrs. N. Pearson	229
135	Norman Meyers	280	195	S. H. Baddeley	228
122	M. G. Leech	280	117	Rod. Jeffrey	229
134	O. Seidel	279	214	T. A. Mentiplay	228
144	Mrs. A. Oxley	276	113	F. W. Day	228
147	G. Dywer	272	176	H. Miller	225
138	L. G. Baxter	269	179	W. Cullen	224
136	Norman Meyers	269	126	E. Jones	224
142	J. Walker	268	129	J. Raby	223
197	J. S. Mills	267	181	Navara Poultry Farm	222
150	J. C. G. Lyon	266	161	J. H. Nichols	222
145	O. H. Gepp	266	236	F. J. Cullane	221
226	R. Bond	261	184	Chas. Ridley	221
215	F. G. Julyan	260	231	A. H. Hocking	220
182	Navara Poultry Farm	259	194	A. Siede and Sons	217
183	Chas. Ridley	258	222	Claud Langley	215
114	F. W. Day	258	193	A. Siede and Sons	215
146	O. H. Gepp	257	157	H. J. Bradshaw	215
140	A. O. Clifford	256	227	Navara Poultry Farm	214
187	C. B. Bertelsmeier	255	111	C. C. Dunn	213
229	B. Harrison	254	220	Britannia Poultry Farm	211
208	T. J. Stevens	252	209	Warenda	211
174	J. H. Duncan	250	235	F. J. Cullane	209
118	Rod. Jeffrey	250	204	Mrs. T. Wilson	209
216	F. G. Julyan	249	152	Mrs. W. Pert	209
173	J. H. Duncan	249	156	L. F. Bush	208
163	Ceres Stud	249	217	R. R. Christie	206
180	W. Cullen	248	191	P. N. Tilley	205
205	A. Reynolds	247	221	Claud Langley	204
186	J. B. Nicoll	247	185	J. B. Nicoll	203
155	L. F. Bush	246	169	G. McDonnell	203
178	G. A. Burchell	245	218	R. R. Christie	201
151	Mrs. W. Pert	244	189	R. Roche	201
149	J. C. G. Lyon	241	133	O. Seidel	201
170	G. McDonnell	240	230	B. Harrison	198
121	M. G. Leech	240	210	Warenda	198
115	J. A. Gingell	240	201	Solway Poultry Farm	198
177	G. A. Burchell	239	137	L. G. Baxter	197
168	H. R. McChesney	238	228	Navara Poultry Farm	195
225	R. Bond	237	213	T. A. Mentiplay	195
123	Jarrahdale Poultry Farm	236	130	J. Raby	195
132	Latona Poultry Farm	233	127	L. E. Clarke	193
125	E. Jones	232	119	J. S. Buchan	192
233	H. H. Calvert	231	199	Jack Ryan	191
207	T. J. Stevens	231	172	A. H. Cocks	191

FINAL RESULTS—*continued.*

SECTION B.—INDIVIDUAL BIRDS—*continued.*

Pen No.	Competitor.	Total to 31st March, 1925.	Pen No.	Competitor.	Total to 31st March, 1925.

CLASS 1.—LEGHORNS, WET MASH (WHITE LEGHORNS)—*continued.*

164	Ceres Stud	191	223	C. H. Jenkin	157
139	A. O. Clifford	190	116	J. A. Gingell	153
212	Mrs. N. Pearson ..	188	154	A. A. Smith	152
171	A. H. Cocks	185	175	H. Miller	143
159	J. J. Hooper	185	196	S. H. Baddeley ..	135
158	H. J. Bradshaw ..	184	200	Jack Ryan	124
198	J. S. Mills	182	153	A. A. Smith	103
188	C. B. Bertelsmeier ..	182	120	J. S. Buchan	(*d*) 88
124	Jarrahdale Poultry Farm	175	234	H. H. Calvert	(*d*) 71
232	A. H. Hocking ..	174	128	L. E. Clarke	63
166	W. Coats	168	131	Latona Poultry Farm ..	(*d*) 60
112	C. C. Dunn	159	219	Britannia Poultry Farm..	4
165	W. Coats	158			

Class 2.—Leghorns, Dry Mash (all White Leghorns except Pens 109 and 110 Brown Leghorns).

91	Norman Meyers ..	303	82	H. W. Smith	233
94	W. Cook	301	90	Chas. Ridley	232
85	Claud Langley ..	280	77	J. H. Duncan	232
95	Ceres Stud	277	105	T. J. Stevens	230
81	H. W. Smith	269	83	J. S. Mills	230
73	Jack Ryan	268	80	P. N. Tilley	224
79	P. N. Tilley	267	63	Braeside Poultry Farm ..	221
68	J. J. Condon	261	107	G. W. Stagg ..	219
64	Braeside Poultry Farm ..	261	70	H. J. Bradshaw ..	216
97	T. A. Mentiplay ..	259	103	Mrs. T. Wilson.. ..	215
93	W. Cook	258	87	Arlington Poultry Farm..	213
72	Rod. Jeffrey	256	89	Chas. Ridley	212
92	Norman Meyers ..	252	84	J. S. Mills	211
104	Mrs. T. Wilson.. ..	250	101	A. A. Smith	209
106	T. J. Stevens	245	86	Claud Langley ..	209
108	G. W. Stagg	243	65	Mrs. W. Pert	207
78	J. H. Duncan	243	102	A. A. Smith	199
74	Jack Ryan	241	109	Strathdoon Stud ..	193
98	T. A. Mentiplay ..	240	76	G. McDonnell	193
96	Ceres Stud	240	88	Arlington Poultry Farm	186
100	G. G. Stud	235	110	Strathdoon Stud ..	150
67	J. J. Condon	235	69	H. J. Bradshaw ..	132
66	Mrs. W. Pert	235	71	Rod. Jeffrey	117
75	G. McDonnell	234	99	G. G. Studd	(*d*) 97

Class 3.—All Light Breeds (other than Leghorns, Anconas, and Minorcas), Wet Mash (Sicilian Buttercups).

61	S. C. Handley	234	62	S. C. Handley	197

FINAL RESULTS—*continued.*

SECTION B.—INDIVIDUAL BIRDS—*continued.*

Pen No.	Competitor.	Total to 31st March, 1925.	Pen No.	Competitor.	Total to 31st March, 1925.
Class 4.—Orpingtons, any colour, Wet Mash (Black Orpingtons except Pens 59 and 60 Buff Orpingtons).					
11	F. G. Julyan	289	29	C. C. Dunn	226
24	Roy Sanders	280	58	Ingram and Sons ..	226
40	Mrs. N. Pearson ..	277	2	A. H. Cocks	226
20	Colvin Bros.	271	12	F. G. Julyan	222
10	H. R. McChesney ..	270	34	D. Gibson	220
44	T. L. Eastaugh ..	266	45	W. L. Caspar	218
22	Henencourt Poultry Farm	262	39	Mrs. N. Pearson ..	217
25	J. T. Cornish	259	23	Roy Sanders	214
1	A. H. Cocks	259	27	G. Dwyer	212
18	W. Cullen	257	59	Braeside Poultry Farm ..	209
49	C. E. Graham	256	47	T. A. Mentiplay ..	204
43	T. L. Eastaugh ..	256	5	J. A. Gingell	202
38	Solway Poultry Farm ..	254	8	F. W. Gough	201
3	R. R. Christie	250	33	D. Gibson	200
21	Henencourt Poultry Farm	248	50	C. E. Graham	191
26	J. T. Cornish	247	55	Todd and Mentiplay ..	186
42	Andrew Baker ..	246	30	C. C. Dunn	182
35	J. Naylor	245	41	Andrew Baker ..	179
19	Colvin Bros.	245	15	Marville Poultry Farm ..	175
37	Solway Poultry Farm ..	244	60	Braeside Poultry Farm ..	168
57	Ingram and Sons ..	242	32	J. C. G. Lyon	165
14	A. Siede and Sons ..	240	28	G. Dwyer	163
48	T. A. Mentiplay ..	240	16	Marville Poultry Farm ..	162
17	W. Cullen	238	4	R. R. Christie	147
51	Wingood Poultry Yard	232	7	F. W. Gough	(*d*) 135
13	A. Siede and Sons ..	227	31	J. C. G. Lyon	(*d*) 124
52	Wingood Poultry Yard ..	227	6	J. A. Gingell	(*d*) 14

THE WOOLLY APHIS PARASITE (*Aphelinus mali*).

(Continued from page 173.)

By G. T. Levick, B.Ag. Sc., Science Field Officer.

Little information appears to be available regarding the activities of the *Aphelinus mali* in the United States of America, from which country New Zealand obtained the nucleus of the brood that has degraded the woolly aphis in the Dominion from its rank as a pest of first importance.

A supply was taken from America to the Transvaal some years ago, but the parasites were not then the success that was anticipated. A later introduction to South Africa from New Zealand, however, seems to be giving better results in the Union.

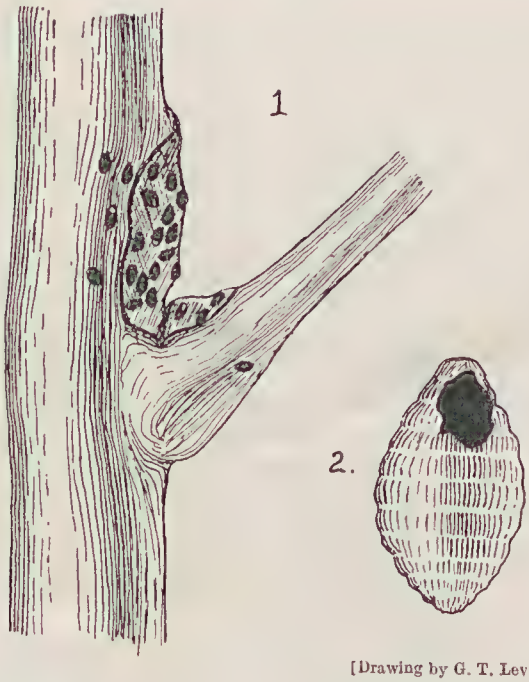
The New Zealand strain is a cross between varieties taken from three widely separated parts of the United States, and appears exceptionally vigorous. The first specimens of Aphelinus to arrive in New Zealand were imported early in 1921, when three males and two females arrived alive. These were liberated in an insectarium on trees especially infected with woolly aphis for the reception of the parasites, and as soon as they increased sufficiently in numbers, the work of distributing the parasites to the fruit-growing districts commenced. In the three years following, i.e., 1922, 1923, 1924, the numbers reared, collected, and distributed increased progressively, until during the season 1923-4 two assistant entomologists were engaged on this work, while a third assistant had to be employed to help in the work during the heaviest part of the season, and a total of approximately 100,000 *Aphelinus mali* were sent out to the various provinces in this one year.

From New Zealand, the parasites were imported into Australia, and, in the winter of 1923, Mr. L. J. Newman, of Western Australia, and Mr. E. Jarvis, of Queensland, established them in their respective States. Opposition was, however, experienced in the introduction of the Aphelinus to some States. Were people going to be burdened with another introduced pest like the fox, the starling, and the rabbit? Such fears had absolutely no foundation, as these predaceous insects, lacking their natural food, the woolly aphis, either die out or turn their attention to some equally noxious allied form of aphid. A factor which required more careful consideration was the danger of introducing "Fireblight," a bacterial disease, which was causing great havoc in the orchards of the North Island of New Zealand. The disease, however, was quite unknown in the South Island, where the parasites were bred, so the danger from this source appeared practically negligible.

A consignment of twigs bearing the parasitized aphis was forwarded to the Victorian Department of Agriculture by Dr. R. J. Tillyard, of the Cawthron Institute, New Zealand, in response to a request by the Victorian Government Entomologist, who, after carefully considering the factors mentioned above, and discussing the matter with Dr. Tillyard when that gentleman attended the recent Pan-Pacific Conference, decided that it would be to the utmost benefit to the apple-growers of this State for the parasites to be introduced.

After many delays, owing to shipping troubles, the twigs arrived here in October, 1924. They were subjected to careful examination, and held under quarantine conditions until the Aphelinus hatched out, and were then burnt.

The Aphelinus were liberated at the Burnley Horticultural Gardens on a tree badly infested with woolly aphis, which had been specially prepared and covered in with buttercloth. About a month later a similar consignment was received by the Horticultural Division from Mr. Newman, the Government Entomologist of Western Australia. No preparations had been made to deal with these separately, and as soon as the insects were hatched, they were liberated on the same tree



[Drawing by G. T. Levick.

1. Portion of Twig showing Parasitized Woolly Aphis (enlarged). (Note (a) absence of Woolly Material, and (b) Dark Color of Aphis).

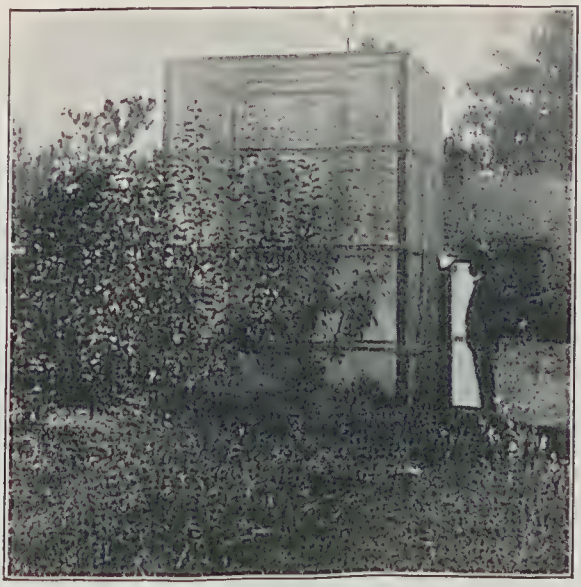
2. Woolly Aphid from which Parasite has emerged (enlarged).

as the previous consignment from New Zealand, hence our present strain would seem to be a cross between these two strains. The Western Australian *Aphelinus mali,* as I have already mentioned, also originated in New Zealand.

In the February number of this *Journal,* a short account of the distribution of the Aphelinus in Victoria was given, and since that time the parasites have been liberated in all the more important apple-growing districts of the State. This work was carried out chiefly by the Orchard Supervisors of the districts concerned, and their enthusiastic co-operation has been invaluable in widely distributing the parasites in the little while at our disposal this season.

The mode of dispersion used in New Zealand is to collect the adult wasps in glass tubes to the number of about twenty in each tube. A nest of these tubes is then sent to each grower. In spite of its obvious advantages, this method has not been followed here, owing to the amount of time and labour involved. Instead, twigs bearing parasited aphis are cut from the trees when the majority of the Aphelinus is in the pupa stage. These twigs are tied on to a badly infested branch on the tree to be parasitized, and the whole covered with a loose buttercloth sleeve, so as to concentrate the parasites, and to protect them until they have an opportunity to establish themselves.

These *Aphelinus mali* will hatch out in a few days, and lay their eggs on the woolly aphis on the branch inside the buttercloth sleeve.



One of the Buttercloth Screens in which the *Aphelinus mali* are propagated at Burnley.

When the eggs have hatched, and the grubs have passed through their larval and pupal stages, and are about ready to become perfect insects, the sleeve is removed, and the emerging wasps are allowed to go free. This method has proved very successful, and is particularly applicable here, where the life history of the parasite occupies only one-half the time it does in New Zealand, thus making it a relatively simple matter to procure twigs in the right stage.

To date, the Aphelinus has been distributed in this manner to over fifty orchards throughout the State, and of those that have been inspected, in practically every case the Aphelinus is well established.

The spraying of the infected trees is a point of some importance, and though we have not yet been able to carry out comprehensive experiments in this direction, the New Zealand experiences will be more or

less applicable here. The following excerpts from an account by Dr. R. J. Tillyard will therefore be of interest:—

> "The adult *Aphelinus mali* is not affected to any appreciable extent by sprays of any kind. The pupa or chrysalis, safe within the hardened body of its aphid host, is likewise quite untouched by sprays. The larva or grub, passing its life within the living body of the aphis will manifestly be affected by sprays which kill its host before it has reached full growth. Experiment shows that the Aphelinus will stand the full summer programme of spraying for codlin moth and black spot without being affected by them. Early oil spraying for red spider may be still carried out, as none of the Aphelinus will then be in the larval stage."

However, it is recommended here that wherever the Aphelinus has taken a hold the affected trees should not be sprayed with any oil, tobacco, or soap sprays, at least until the Aphelinus is so thoroughly established that there will be no danger of its accidental extermination by a spray applied at an unsuitable period.

A VALUABLE SWAMP GRASS.

Glyceria (Poa) *aquatica*, Wahlenb, "Water Spear Grass or Reed Meadow Grass."

By J. W. Audas, F.L.S., F.R.M.S., Senior Assistant, National Herbarium, Melbourne.

Large areas of swamp lands exist in all the Australian States. Owing to the cost of reclamation and attendant difficulties, a great part of these remain undrained, though certain portions situated in the more settled districts have been reclaimed by the Government and made available for settlement. The usual practice is to drain the swamps thoroughly and lay them down to pasture grasses.

Indigenous swamp plants are, as a rule, poor in nutritive value, and consequently do not contain sufficient nourishment for stock, and it is only in dry periods they are eaten by them. In Gippsland, for some years past, experiments have been carried out in reclamation. Sedges, rushes, and other aquatic plants, usually comprise the vegetation of the swamp areas there, and consequently some difficulty has been encountered in the work of drainage. Introduced plants, such as *Paspalum distichum* (Silt Grass), *Paspalum dilatatum* (Golden Crown Grass), *Alopecurus geniculatus* (Marsh Foxtail Grass), *Festuca gigantea* (Tall Fescue), and *Phalaris arundinacea* (Reed Canary Grass), have been tried to overcome the rampant native growth of the swamps, but none of them is sufficiently strong to do this.

In recent years, the plant *Glyceria aquatica* has been tried with satisfactory results in various parts of the Commonwealth. A feature of this grass is that it is sometimes difficult to raise from artificially-sown seed, as the seed soon becomes infertile; but fertile seeds falling directly from the plant into the mud will germinate quickly. Propagation is easily and rapidly effected by planting roots in wet places or

in shallow water; and roots pulled from deeper water propagate readily when placed in swamps, and by this latter method considerable plantings have been made.

A large quantity of fodder may be obtained from these plants during eight or nine months of the year, and as much as 50 tons of green and over 30 tons of dry fodder per acre have been cut. Stock of all kinds relish it, and it has a protein value higher than either Japanese Millet or Golden Crown Grass. The upright growth of *Glyceria aquatica* makes the grass very valuable in swamp lands subject to inundations, as it keeps sweet when other grasses are badly soiled and rendered unpalatable. It will overcome all other swamp vegetation in swamps and morasses carrying water all the year round, and can be usefully planted along the muddy banks of water-courses. Planting may be

Poa Aquatica growing in a Gippsland Swamp.

effectively carried out at any period of the year. The roots are best distributed in sods. Should the surface of the swamp become dry, the plant will live long, as its fibrous roots are in damp ground. It can be grown in salty marshes, but not so successfully as in fresh water.

From the Tooronga Valley, in West Gippsland, this valuable grass has been introduced into many swamps. At Noojee, Gippsland, it flourishes on many farms and it is also growing well in the Loch and Latrobe Valleys at Neerim.

In his work on "Select Extra-Tropical Plants," Baron von Mueller describes *Glyceria aquatica* as one of the best feeding aquatic grasses. It is a stout, reed-like perennial, with a creeping rootstock, and grows from 4 to 6 feet high. The leaves are flat and very rough on the edges. The panicle is much branched, spreading nearly a foot. The spikelets

are numerous, with from 5 to 8 or 10 flowers on each. The outer glumes are unequal, thin, and I-nerved. Flowering glumes are rather

Poa Aquatica in Blossom.

obtuse, scarious at the top, and about 1½ lines long; they are loosely imbricated with five or seven strong ribs.

In England and France, *Glyceria aquatica* has been cultivated to some extent for its large yield of coarse hay, and if cut when green and before attaining its full growth, it is said to make a nutritious and palatable fodder.

In supplying analyses of samples of *Glyceria aquatica,* Japanese Millet, and *Paspalum dilatatum*, the Chemist for Agriculture commented as follows:—

> "*Glyceria aquatica* on dry basis compares favorably with both Japanese Millet and *Paspalum dilatatum*. The content of protein is higher in this grass than in the other two mentioned. A high protein content is one of the main considerations in the value of a grass for a fodder. This grass is of strong growth, and should show a high yield of fodder under similar conditions."

Poa Aquatica growing in the Botanic Gardens, Melbourne.

Hereunder is the result of the three analyses:—

	Glyceria (Poa) *aquatica.*	Japanese Millet.	*Paspalum dilatatum.*
Ash	6·60	4·76	8·89
Protein	7·67	6·43	6·31
Fibre	29·07	27·72	28·39
Carbohydrates	54·72	58·78	54·38
Fat	1·94	2·31	3·08

STANDARD HERD TEST.

Report for Quarter ended 31st March, 1925.

In the following is set out the records of all cows which completed a lactation during the quarter. The number is 193, of which 139 qualify for the certificate. The printing in *italics* indicates those animals which failed to yield the quantity of butter fat necessary for a certificate:—

(The amount of butter-fat, required for qualification, varies according to the age of the animal (up to 5 years) at time of calving, the standards being as follow:—

Junior 2-year old	(under 2½ years at time of calving),	200 lb. butter-fat.
Senior 2-year-old	(between 2½ and 3 years),	225 ,, ,,
Junior 3-year-old	(between 3 and 3½ years)	250 ,, ,,
Senior 3-year-old	(between 3½ and 4 years),	275 ,, ,,
Junior 4-year-old	(between 4 and 4½ years),	300 ,, ,,
Senior 4-year-old	(between 4½ and 5 years),	325 ,, ,,
Mature cow	(5 years and over),	350 ,, ,,)

Owner.	No. Completed Test.	No. Certificated.	Breed.	Name of Cow.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
								lbs.	lbs.		lbs.	lbs.	
Alston Estate, Cobram	4	4	Jersey ..	Rosebud of Aberdour ..	14944	1.4.24*	273	12½	3,849	6·05	232·95	200	
				Annette of Aberdour ..	14940	13.4.24	273	19	6,259	5·44	340·63	200	
				Regina of Aberdour ..	14943	24.5.24	273	19½	6,654	5·24	348·48	225	
				Bluebell of Aberdour ..	14941	11.6.24	273	20	6,516	5·86	381·98	200	
J. Anderson, junr., Lyndhurst	2	2	Jersey ..	Canary 13th of Kingsvale ..	12850	20.4.24	273	19	5,709	5·39	307·89	200	
				Viola 7th of Kingsvale ..	14123	3.6.24	273	18	5,473	5·69	311·34	200	
Mrs. Archibald and Sons, Elmore	1	1	Jersey ..	Daisy 2nd of Elgnold ..	11924	8.5.24	273	13	5,449	5·33	290·22	275	
W. K. Atkinson, Swan Hill	2	1	Shorthorn	*Queenie 2nd of Willow Park* ..	12350	15.6.24	273	20½	8,511	3·71	*316·15*	325	298
				Pearl of Willow Park ..	10266	16.6.24	273	25	12,198	3·78	460·96	350	328, 393, 399, 354

* Calved prematurely.

STANDARD HERD TEST—*continued.*

Owner.	No. Completed Test.	No. Certificated.	Breed.	Name of Cow.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
								lbs.	lbs.		lbs.	lbs.	
F. Austin, Lara ..	1	1	Jersey ..	Queen of Avalon	12867	22.5.24	273	11½	3,560	6·02	214·42	200	
Baillieu Bros., Echuca	2	1	Jersey ..	*La France of Peeralillea* ..	14954	11.4.24	273	10½	3,874	5·03	*194·96*	225	
				Canary of Peeralillea ..	14953	31.5.24	273	18	5,538	5·49	303·92	225	
C. Bamford, Benalla	2	2	Ayrshire	Treasure of Medburn Grove ..	8316	8.4.24	184*	49½	10,134	4.18	424·08	350	240, 385, 497
				Bertha of Medburn Grove ..	10741	10.4.24	273	13½	8,868	4.13	366·54	325	260, 282
Mrs. Irene Beard, Outtrim	2	1	Jersey ..	*Mary Birt of Kelburn* ..	10145	6.4.24	252	19½	4,918	5·17	*254·37*	350	311, 299
				Cloudy of Linga Longa ..	Not yet allotted	21.4.24	273	15	5,124	5·45	270·34	200	
F. Bidgood, Staghorn Flat	3	3	Jersey ..	Milkmaid of Staghorn ..	9212	24.4.24	273	20½	6,323	5·63	356·28	350	229, 341, 268
				Kyora Pansy 7th	9210	3.6.24	273	29	9,118	4·83	440·78	350	353, 418, 426
				Sir Fancy's Larkspur of Staghorn	10156	19.6.24	273	17	8,079	5·21	421·26	325	277, 309
Mrs. Agnes Black, Noorat	2	1	Jersey ..	*Noorat Mignonette*	9217	12.6.24	230	5½	3,074	4·82	*148·23*	300	180, 240
				Noorat Grey Girl	6412	14.6.24	273	15	7,315	5·03	367·85	350	259, 292, 346, 354, 315
A. A. Broad, Sutton Grange	2	2	Jersey ..	Mignonette of Harcourt ..	12062	3.5.24	273	24½	7,373	4·99	367·82	250	286
				Preston Dairy Girl	12063	19.5.24	273	23	6,356	4·78	303·63	250	266
J. Clyne, Upper Maffra West	1	1	Jersey ..	Forty Winks of Elouera ..	10485	13.5.24	273	16½	4,844	6·32	306·20	275	
Clyne Bros., Tinamba	1	1	Jersey ..	Dunalister Garantie ..	10371	7.4.24	273	17½	6,544	5·46	357·22	350	267

* Herd sold.

STANDARD HERD TEST—*continued*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
								lbs.	lbs.		lbs.	lbs.	
W. and J. Cockbill, Bacchus Marsh	1	Nil	Ayrshire	*Leila of Warrook*	5173	6.4.24	273	15½	5,539	4·61	*255·57*	350	287, 334, 334, 293, 85
A. T. Corben, Irrewarra	1	Nil	Jersey ..	*Jubilee Wynda Wild Flower* .	7348	1.6.24	273	5	5,565	5·57	*310·19*	350	270, 291, 211, 235
E. Day, Penshurst	1	1	Jersey ..	Midnight of Clover Flat ..	7445	16.5.24	273	29½	8,320	5·35	445·53	350	
E. A. Denis, Swanpool	1	1	Jersey ..	Marise of Tarnpirr	15479	12.4.24	273	18½	8,184	5·03	411·31	300	267
Department of Agriculture	2	1	Red Poll	Beltana	239A	14.4.24	273	22	7,794	4·44	346·11	325	269, 325
				Three Castles	402c	15.5.24	273	19	6,570	4.36	*286·77*	325	200, 301
	3	Nil	Friesian	*Victoria Bellona*	993	30.3.24	210	4	4,186	3·37	*141·00*	325	238, 194
				Victoria Coriander	992	31.3.24	273	25½	8,418	3·39	*285·07*	325	195
				Victoria Dutch Maid ..	991	14.4.24	273	14½	6,955	3·62	*272·42*	350	242, 244, 244
	1	1	Jersey ..	Collingwood's Beauty ..	6749	13.4.24	273	19	6,180	6·23	385·02	350	357, 257, 385, 307
H. Dettmann, Kyneton	1	Nil	Jersey ..	*Buttercup 3rd of Bonshaw* ..	7099	1.5.24	137	11	1,988	5·39	*107 14*	350	83, 211, 251
C. Deverell, Wangaratta	5	3	Jersey ..	Gold Bell of Methven ..	9293	29.3.24	273	26	8,796	4·67	410·69	350	413, 516, 517
				Gold Bird of Methven ..	13713	13.4.24	226	11½	3,134	5·91	*185·15*	275	329, 365
				Dianthus of Methven ..	12174	24.4.24	273	8½	3,634	6·48	235·32	225	258
				Carnation of Methven ..	Not yet allotted	26.5.24	273	22½	6,520	4.58	298·31	200	
				Calla of Methven	Not yet allotted	9.6.24	240	11½	3,465	5·27	*182·53*	200	

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk	Average Test	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
								lbs.	lbs.		lbs.	lbs.	
Dickinson Bros., Sebastopol	1	1	Friesian	Pauline 4th of Ashby ..	1006	15.4.24	273	23	7,508	3·45	259·06	200	
G. Esler, Tongala ..	2	1	Jersey ..	*Jubilee Orange Blossom* ..	12227	16.4.24	273	11½	3,849	5·04	*193·94*	200	
				Jubilee Thyme	14149	1.5.24	273	17½	6,729	5·29	356·02	200	
Evans Bros., Lima East	4	3	Red Poll	Flowing Vale Gracie ..	879C	24.4.24	273	19½	5,751	4·21	242·10	200	
				Gertie	132AA	23.5.24	273	16	6,511	3·72	*242·29*	350	212
				Flowing Vale Cherry Lea ..	587AA	4.6.24	273	18½	6,831	4·59	313·28	225	
				Cherry Pie 2nd	120AA	7.6.24	273	10	8,257	3·87	319·29	275	232
C. Falkenberg, Elliminyt	1	1	Jersey ..	Daphne of Colac	14980	28.4.24	273	10	4,597	5·68	261·22	225	
R. Faragher, Koroit	2	1	Jersey ..	*Belle A*	6315	25.4.24	273	6	4,655	5·36	*249·40*	350	305, 276, 274
				Belle 2nd of Mona Bank ..	14988	10.6.24	273	6½	4,493	5·31	239·36	200	
R. Ferguson, Riddell	2	Nil	Friesian	*Walulu Abbekerk Artis of Corfield*	550	28.4.24	273	14½	9,041	2·83	*255·77*	350	188, 215
				St. Albans Netherland Lily ..	655	29.5.24	273	13½	7,234	2·90	*209·60*	275	266
A. E. Fewster, Nilma	1	1	Jersey ..	Dunalister Mannikin's Garantie	Not yet allotted	7.5.24	273	14	4,844	5·86	283·93	200	
T. R. Findlay, Leitchville	1	1	Jersey ..	Peeress of Leven Brae ..	11401	12.4.24	273	13	4,919	4·62	227·03	225	

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
								lbs.	lbs.		lbs.	lbs.	
Finn Bros., Bundoora	2	2	Jersey ..	Alice of Comely Banks ..	10229	4.4.24	273	17	7,671	5·14	393·98	275	287
				Science of Springhurst ..	6207	5.6.24	273	17	7,902	5·22	412·65	350	202, 286, 286, 465, 474
Flack and Sewell, Berwick	4	4	Friesian	Bainfield 40	553	12.4.24	273	30⅛	17,131	3·52	602·72	350	307, 304, 395
				Springfield White Posch ..	566	16.5.24	273	..	10,015	4·03	404·03	350	217, 296, 332
				Monovale Amethyst Paxton	148	5.6.24	273	19½	11,760	3·96	465·62	350	365, 434
				Burnbank Fayne Segis Patch	Not yet allotted	21.6.24	273	24	7,774	4·32	335·98	225	
Mrs. M. and W. A. Francis, Kilcunda	2	Nil	Ayrshire	*Rosebud of Hillcrest* ..	9080	27.6.24	273	10½	4,429	4·39	*194·35*	250	163
				Rose of Hillcrest	9079	16.6.24	273	5	4,500	4·42	*199·12*	300	211, 180
G. Gange, Mininera	5	5	Ayrshire	Airlie of Roseleigh	12103	15.5.24	273	17	7,666	3·85	295·05	200	
				Boronia of Roseleigh ..	12106	6.6.24	273	18½	6,745	4·20	283·46	225	
				Rosebud of Roseleigh ..	12109	7.6.24	273	17	7,393	4·10	302·82	225	
				Audrey of Roseleigh ..	12105	8.6.24	273	8½	5,281	4·67	246·72	200	
				Pearl of Roseleigh	12108	22.6.24	273	7½	6,297	4·28	269·81	200	
R. Goodman, Kilmany South	2	2	Ayrshire	Lily of Roseneath	9135	23.2.24	273	21	7,052	3·94	277·59	200	
				Floss of Roseneath ..	7333	27.2.24	273	19½	6,594	4·77	314·44	275	231
A. Gorman, Alexandra	1	Nil	Ayrshire	*Duchess of Glenvairn* ..	4409	8.6.24	273	20	7,168	4·56	*326·64*	350	
O. G. Handbury, Toora	3	2	Jersey	Princess 2nd of Strathbow ..	12206	30.5.24	273	18½	7,314	5·93	433·74	225	345
				Jessie 33rd of Melrose ..	13422	4.6.24	273	8	4,839	5·90	285·38	225	256
				May of Clover Flat ..	7444	25.6.24	273	14½	6,509	5·34	*347·53*	350	257, 316, 411, 403
M. H. Hearn, Elliminyt	1	1	Jersey ..	Music of Colac	14984	16.5.24	273	15½	5,596	5·68	317·61	225	

STANDARD HERD TEST—*continued.*

Owner.	No. Completed Test.	No. Certificated.	Breed.	Name of Cow.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
								lbs.	lbs.		lbs.	lbs	
R. J. Henry, Euroa	2	2	Jersey ..	Coleus of Springhurst ..	7325	31.5.24	270	15½	6,689	6·39	425·25	350	179, 402, 508
				Myrtle of Springhurst ..	7331	2.6.24	273	15½	8,414	6·26	526·36	350	146, 349, 481
J. A. Huffer, Gormandale	2	1	Jersey ..	*Dunalister Mannikin Sand Daisy*	10399	2.4.24	138	4	1,930	5·24	*101·09*	275	262
				Waverley Lass 3rd of Melrose	6312	7.6.24	273	20½	6,913	5·67	392·30	350	269, 350, 395, 392, 403, 386
J. Hutchinson, Somerville	5	5	Jersey	Vesta of Somerville	11491	8.4.24	273	26	9,048	5·04	456·08	250	371
				Beauty 4th of Somerville ..	6945	19.4.24	273	28	10,880	5·15	560·15	350	504, 543, 475, 552
				Princess Valda of Somerville..	11488	10.5.24	273	28½	9,138	5·42	495·06	275	342
				Northwood Queen of Somerville	9417	15.5.24	273	31½	10,275	4·83	496·24	325	337, 469
				Silver Maid of Glenwood ..	13404	16.6.24	273	17	5,579	5·87	327·22	250	255
A. W. Jones and Son, Whittington	6	6	Jersey	Fuchsia of St. Albans ..	13209	3.4.24	273	20½	6,170	5·61	345·93	325	328, 373
				Fuchsia 3rd of St. Albans ..	Vol. XII.	20.5.24	273	20½	6,246	5·75	359·36	200	
				Lady Grey 1st of St. Albans..	4186	21.5.24	273	21	7,511	6·04	453·46	350	347, 409, 404, 466, 529, 464, 385, 265
				Beauty 3rd of St. Albans ..	Vol. XII.	23.5.24	273	23½	7,055	5·07	358·00	200	
				Butter Queen 2nd of Meryula	9736	3.6.24	273	20½	6,801	5·17	351·92	350	292, 272, 389
				Mystery 22nd of Melrose ..	8422	11.6.24	273	12	7,118	6·43	457·55	300	325, 424
	6	5	Friesian	Henley Mooie Oakdale ..	801	28.3.24	273	22	10,460	3·77	394·76	275	
				St. Albans May Queen ..	1036	1.4.24	273	16½	9,677	3·38	326·85	325	275, 313
				Westmere Inka Pietertje ..	1032	11.4.24	273	27	11,016	3·85	424·07	325	348, 389
				St. Alban's Woodcrest Nellie	1684	11.4.24	273	32	10,045	3·22	323·28	225	
				Bell of Craigneil	1031	19.4.24	273	13½	7,792	3·31	*257·87*	350	294, 275, 329
				May Queen 2nd's Grand Daughter	1674	21.5.24	273	23	8,054	3·39	273·35	200	
E. Talbot Jones, Clematis	2	Nil	Friesian	*Diana of Craigneil* ..	1039	4.6.24	266	4	4,807	3·43	*165·10*	350	187
				Wild Tulip 2nd ..	1041	26.6.24	273	18	7,380	3.97	*292·63*	325	205

STANDARD HERD TEST—*continued.*

Owner.	No. Completed Test.	No. Certificated.	Breed.	Name of Cow.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
								lbs.	lbs.		lbs.	lbs.	
J. F. Keating, Darnum	1	1	Red Poll	Sappho	2754	6.5.24	273	21	8,246	4·46	367·45	275	
D. Kilby, Paraparap	4	1	Ayrshire	Gladness 4th of Struan Park..	12367	15.4.24	269	8	6,126	5·06	309·87	275	
				Glad's Twin 2nd of Struan Park	12368	26.4.24	246	4	5,438	4·60	*250·37*	275	
				Anitra 2nd of Struan Park ..	12154	27.4.24	252	6½	3,087	5·05	*156·02*	225	
				Mirth of Struan Park ..	5183	28.6.24	240	8½	6,435	4·14	*266·26*	350	
A. Kirby, Daylesford	2	Nil	Ayrshire	*Lily of Wattle Bank* ..	9686	21.4.24	249	4	5,349	4·50	*240·74*	350	256, 276
				Pride of Wattle Bank ..	5315	22.4.24	273	12	8,298	4·07	*338·04*	350	272, 346
Mrs. E. M. Lennie, Tongala	1	1	Jersey ..	Starbright of Lynroy ..	9759	11.4.24	273	24	8,009	5·16	413·66	350	365, 340
J. G. Lobb, Tooradin	1	1	Ayrshire	Vida of Burnside	9788	25.5.24	273	20½	8,800	4·28	376·75	350	224
Longerenong Agricultural College, Dooen	3	2	Ayrshire	Laurel of Longerenong ..	9791	13.4.24	273	17	8,658	4·32	373·85	325	266
				Coral of Willow Vale ..	5346	16.4.24	273	13	7,914	5·26	419·53	350	281
				Ivy of Willow Vale	5348	21.6.24	273	5½	6,378	4·28	*273·01*	350	223
H. Luxton, Whittlesea	1	1	Jersey ..	Lady Lucy of Aveley ..	11569	5.5.24	273	20	6,833	5·12	349·56	200	
H. G. Lyon, Dundonnell	1	1	Jersey ..	Jacqueline's Lily of Hill Green	12235	4.1.24	273	8	3,630	6·01	218·34	200	
C. G. Lyon, Heidelberg	3	3	Jersey ..	Silvermine 25th of Banyule ..	11602	6.4.24	273	15½	5,347	5·96	318·48	200	
				Hawthorn 9th of Banyule ..	11583	9.6.24	273	15	5,505	5·31	292·44	200	
				Soprano 4th of Banyule ..	11607	25.6.24	273	21	7,361	5·23	384·71	200	

STANDARD HERD TEST—*continued.*

Owner.	No. Completed Test.	No. Certificated.	Breed.	Name of Cow.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
								lbs.	lbs.		lbs.	lbs.	
M. Lyons, Bamawn	2	2	Jersey ..	Graceful Duchess 29th of Melrose	15013	11.4.24	273	16	4,179	6·31	263·62	225	
				Gaiety Girl 14th of Melrose	15012	15.6.24	273	17	5,091	5·44	276·98	200	
C. W. Macauley, Rochester	1	1	Jersey ..	Pansy of Liscard	14145	21.6.24	273	11	3,631	5·69	206·48	200	
J. McDougal, Byaduk	1	1	Jersey ..	Biddy 2nd of Kilburn ..	12072	16.4.24	273	16½	6,235	5·22	325·57	250	
K. McGarvie, Pomborneit	16	15	Jersey ..	Mollie of Greenwood ..	12987	6.4.24	273	13	4,931	5·60	276·33	225	
				Dinah of Greenwood ..	12972	7.4.24	273	20½	7,259	5·62	407·74	225	
				Modest of Greenwood ..	9529	9.4.24	273	18½	8,174	4·81	393·30	325	320
				Bumper 2nd of Greenwood ..	10326	10.4.24	273	16	6,027	5·23	315·19	275	196
				Chrissie of Greenwood ..	12978	11.4.24	273	16	5,648	5·83	329·23	225	
				Music of Greenwood ..	10332	,,	273	12½	6,460	4·46	288·32	275	217
				Minnie 2nd of Greenwood ..	9527	15.4.24	273	16	6,786	5·05	342·98	325	
				Larkspur of Greenwood ..	12975	,,	273	11	5,658	6·02	340·85	225	
				Missie of Greenwood ..	12976	16.4.24	273	15	6,444	5·21	336·00	250	
				Marigold 2nd of Greenwood ..	12986	17.4.24	273	15	5,992	5·31	318·00	225	
				Madge of Greenwood ..	9525	18.4.24	273	21	8,615	4·23	364·60	325	303
				Melba of Greenwood ..	6131	21.4.24	273	21	8,872	4·47	396·21	350	
				Jewel of Greenwood ..	12984	23.4.24	261	8	5,979	5·31	317·81	225	
				Dot of Greenwood	12980	24.4.24	273	21	7,291	5·65	412·20	225	
				Claribelle of Greenwood ..	5302	2.5.24	273	17	9,430	3·98	375·69	350	325
				Amelia's Lady of Waterloo Farm	9360	6.6.24	7	12	6,490	5·24	*339·88*	350	
R. Maher, Wyuna South	1	Nil	Jersey ..	*Daphne of Welbourne* ..	10467	8.4.24	273	18	6,266	5·48	*343·09*	350	274
W. Meredith, Ondit	2	Nil	Ayrshire	*Affection of Woongarra* ..	9862	28.3.24	251	4	4,716	4·73	*213·19*	250	
				Iulian of Willow Vale ..	4650	19.4.24	229	4	5,758	4·41	*253·67*	350	298, 312, 174

STANDARD HERD TEST—*continued.*

Owner.	No. Completed Test.	No. Certificated.	Breed.	Name of Cow.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
								lbs.	lbs.		lbs.	lbs.	
T. Mesley, Dalyston	1	1	Jersey ..	Namesake 3rd of Warenda ..	15018	18.6.24	273	16	6,302	6·20	390·96	225	
Mrs. Lilian Orchard, Grahamvale	1	Nil	Jersey ..	*Pansy of Grahamsvale* ..	5330	21.4.24	273	11	5,445	5·28	287·32	350	227, 213, 346, 226, 202, 267
D. Peter, Heidelberg	1	Nil	Jersey ..	*Dunalister Noble Myrtle* ..	10406	21.5.24	273	21	6,523	5·18	337·78	350	362
J. Phillips, Murraydale	1	1	Jersey ..	Faith of Peri	13011	30.4.24*	273	19½	5,634	4·73	266·30	225	
J. Plattfuss, Tongala	1	1	Friesian	Springfield Ideal Keys ..	980	12.4.24	273	27	8,072	3·19	257·42	250	211
R. Purnell, Moriac..	1	1	Jersey ..	Mystery of St. Albans ..	13012	26.4.24	273	19	5,958	6·33	379·08	200	
Quigley and Bennett, Yinnar	2	2	Jersey ..	Kirsty 14th of Jerseyholm ..	12945	18.4.24	273	15	4,847	6·30	305·55	200	
				Bluebell 4th of Jerseyholm ..	Not yet allotted	31.5.24	273	18½	5,999	5·94	356·61	200	
F. Raggatt, Euroa..	2	1	Jersey ..	*Rhea Reid of Clematis* ..	10463	30.3.24	258	9½	3,828	4·63	177·17	325	160
				Lantana 2nd of Springhurst ..	10446	27.4.24	273	13	5,364	6·11	328·05	275	375, 411
Miss H. E. Raleigh, Pakenham Upper	1	1	Jersey ..	Zoe 7th of Melrose	14236	28.5.24	273	16	6,493	5·15	334·25	200	

* A premature calving.

STANDARD HERD TEST—*continued.*

Owner.	No. completed Test.	No. Certificated.	Breed.	Name of Cow.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
								lbs.			lbs.	lbs.	
R. Ralston, Mogloneby	1	1	Ayrshire	Dairy Lass of Ben Kell ..	11344	26.4.24	273	16	5,798	5·11	296·05	200	
J. D. Read, Springhurst	13	13	Jersey ..	Heather of Springhurst ..	12218	28.3.24	273	15	6,359	5·62	357·61	225	242
				Sulla of Springhurst ..	12224	31.3.24	273	7	5,968	5·03	300·33	225	250
				Alfalfa of Springhurst ..	14237	,,	273	10	5,313	5·15	273·38	200	
				Dianthus of Springhurst ..	12215	5.4.24	273	15	6,284	6·25	392·61	225	274
				Romneya of Springhurst ..	9663	11.4.24	137*	35½	6,791	5·26	357·01†	350	293, 394, 441
				Lucerne of Springhurst ..	5399	16.4.24	273	16	8,428	5·75	484·46	350	305, 334, 286, 349, 351
				Tecoma of Springhurst ..	12225	24.4.24	273	20	7,894	5·42	427·83	225	288
				Alsyke 2nd of Springhurst ..	10437	,,	273	17½	7,296	6·68	487·48	300	255, 291
				Melilot of Springhurst ..	9659	2.5.24	273	17	8,798	5·76	507·11	350	281, 350, 367
				Dahlia of Springhurst ..	9652	21.5.24	273	16	7,027	6·30	442·63	350	246, 355, 421
				Monkshood of Springhurst ..	12219	27.5.24	273	16½	7,900	5·26	415·91	250	238
				Polygold of Springhurst ..	12221	28.5.24	273	14½	6,405	5·66	362·43	250	215
				Clianthus of Springhurst ..	10440	8.5.24	273	17	6,921	6·53	451·83	300	263
Red Cross Farm, Bundoora	4	1	Friesian	*Holland Lass of Berry* ..	96	27.4.24	273	23½	7,387	3·39	*250·26*	350	228, 207, 193
				Miss Muller 3rd of Berry ..	242	8.6.24	273	26	8,749	3·28	*287·02*	350	278, 275
				Jessie de Kol Kroons of Oakview	1089	15.6.24	273	13½	7,445	3·61	*268·57*	325	221, 240
				Segis Hengerveld of Lydholme	522	23.6.24	273	33½	10,617	3·57	378·80	325	307, 252, 296
W. S. Richardson, Riddell	1	Nil	Jersey ..	*Mignonette of Brookfield* ..	9609	18.5.24	273	17	5,268	5·41	*285·02*	350	
S. Russell, Tongala	1	Nil	Friesian	*Mossvale Jean*	Append. 4	18.4.24	273	20	6,659	3·75	*249·59*	350	
A. H. Schier, Kernot	5	Nil	Ayrshire	*Scotswood Extra Quality* ..	10297	22.4.24	267	4	3,588	4·69	*167·96*	250	175
				Mona of Inverleigh	5862	22.4.24	251	4	3,381	3·98	*134·74*	350	137, 114, 108, 119
				Scotswood Gaiety	7714	26.4.24	273	12	5,488	4·14	*226·32*	275	151
				Scotswood Mystic	10318	5.5.24	273	17½	6,415	4·00	*257·54*	275	280
				Daisy of Inverleigh	6855	9.5.24	256	4	4,067	3·90	*158·23*	350	239, 192, 166

* Died. † Milked thrice daily.

STANDARD HERD TEST—*continued.*

Owner.	No. Completed Test.	No. Certificated.	Breed.	Name of Cow.	Herd Book No.	Date of Calving.	Days in Test.	Milk last Day of Test.	Milk.	Average Test.	Butter Fat.	Standard required.	Previous Yields of Butter Fat in lbs.
								lbs.	lbs.		lbs.	lbs.	
O. J. Syme, Macedon	6	5	Friesian	*Jennie de Kol*	301	19.4.24	273	23½	9,725	3·58	*348·33*	350	348, 400, 319, 368, 424
				Bolobek Fanny	1188	28.4.24	273	21	9,073	3·29	298·26	200	
				Burnside Korndyke Riversdale	1224	20.5.24	273	38½	17,969	2·61	468·77	350	393
				Bolobek Mona	1134	30.5.24	273	19½	8,364	3·41	285·62	225	
				Eco Sylv Belle	1256	7.6.24	273	31	16,586	3·73	625·57	325	566
				Bolobek Anabell	317	24.6.24	273	12½	10,674	3·34	366·21	350	305, 390, 380, 365, 413
L. W. Thompson, Pakenham	3	2	Jersey ..	Canary 4th of Lesterfield ..	10267	10.4.24	273	20	6,562	5·91	388·04	275	274, 383
				Gaiety Girl 12th of Melrose ..	12247	23.4.24	273	6	3,749	5·93	*222·27*	250	246
				Pearl 12th of Melrose ..	12249	4.5.24	273	13	5,083	5·68	288·74	250	273
T. Trevaskis, Tongala	1	1	Jersey ..	Daisy of Ballara	13032	9.6.24	273	5½	5,124	5·28	270·47	225	241
J. T. Tuckey, Alberton	1	Nil	Ayrshire	*Kish of Tregorland*	10557	29.4.24	273	15	5,495	4·03	*221·23*	225	
A. L. N. Walter, Little River	2	2	Jersey ..	Daisy of Paradise ..	13037	30.4.24	273	7½	6,402	4·74	303·37	225	242
				Peerless of Paradise ..	13239	18.6.24	273	14½	5,475	5·25	287·49	225	221
Agricultural High School, Warragul	1	Nil	Red Poll	*Woorndoo*	282A	12.6.24	261	4	5,893	4·80	*283·09*	325	272, 209
H. Webb, Sunbury	1	1	Ayrshire	Model of Holly Green ..	6953	9.5.24	262	6	9,281	4·04	375·22	300	307, 332
J. Wills, Bacchus Marsh	3	2	Friesian	Bolobek Janet	340	23.4.24	273	38	14,777	3·29	485·58	350	350, 473
				Joan of Lerderderg	1142	13.5.24	273	13	6,656	3·11	*207·11*	250	149
				Jennie of Lerderderg ..	1141	25.5.24	273	25	11,529	3·42	393·80	275	277
W. Woodmason, Oakleigh	1	1	Jersey ..	Handsome Girl 10th of Melrose	10521	5.6.24	273	11½	6,129	6·19	379·56	300	298, 390

A CURE FOR THE SELF-SUCKER.

One of the most perplexing problems confronting dairy farmers is the occasional bad habit developed by cows of sucking themselves. Where a large number of dairy calves are raised on skim milk they quite frequently acquire the habit of sucking their stable mates, and often this habit is continued until maturity.

There seems to be no good explanation as to why cows should suck themselves, and it is equally true that in the past there has been no satisfactory method of curing or preventing this bad habit. Various types of muzzles have been suggested, certain types of yokes have been tried, sticks have been attached to halters and passed down between the front legs of the cow and attached to a belt, with the idea of preventing the cow from getting her head back to the udder. Most of these devices have, however, proven ineffective or inhumane, and sooner or later the cow with this habit finds her way to the butcher's shop as the only positive and permanent cure.

Veterinary surgeons in the United States of America have tried an operation which consists of removing a part of the side and end of the tongue, but this has not been very satisfactory.

A simple device in use on the farm of the Georgia State College of Agriculture appears to be 100 per cent. efficient in curing the habit, and it is very inexpensive and simple to use. Take a piece of ordinary ¼-in. pipe about 6 inches in length; put a ring in each end like an ordinary bridle bit. Ten or twelve 1-in. holes are then bored through the pipe in every direction. This hollow bit is put into a halter, or device similar to a bridle. It has been found best to use a nose band on the bridle so as to hold the bit securely in place.

In order for the cow to draw milk she puts her tongue around three sides of the teat and presses it against the roof of her mouth. When she sucks she tends to produce a vacuum. With the hollow bit across the tongue, air is admitted from the ends, and it is impossible for her to draw milk, since she cannot form the necessary vacuum. After a few trials the cow soon learns that she cannot suck and soon stops trying. Nor can she suck other cattle.

The cow eats and ruminates normally with the hollow bit in her mouth. However, it is impossible for her to drink unless the water is deep enough for her to submerge the ends of the pipe.—*Live Stock Journal*, England, 14th November, 1924.

ORCHARD AND GARDEN NOTES.

E. E. Pescott, F.L.S., Pomologist.

The Orchard.

PLANTING.

The time has now arrived for the general planting of deciduous fruit trees. The soil should have previously been well ploughed and subsoiled, and, as far as possible, drained. To insure satisfactory results, it is essential that the orchard be subsoiled. Where expense is a consideration, drainage may be left for subsequent years, but once the orchard has been planted, it will be impossible to subsoil.

When planting out, the distance between the trees will be determined by the kinds to be planted. For ordinary deciduous fruiting trees it is the custom in this State to plant them 20 feet apart in the rows, the rows also being 20 feet apart. Results have proved this to be a satisfactory practice. Almond trees may be planted 15 or 16 feet apart each way, while walnuts and citrus, owing to their spreading habit, often require a distance of 30 feet.

Deep planting is not advocated, the general practice being that the depth of planting in the nursery should be followed. If holes be dug, they should be shallow, the bottom being merely loosened to allow a comfortable friable bed for the tree roots. A good practice is to dig the whole strip along which the trees are to be planted, merely removing sufficient soil afterwards when planting. Another satisfactory custom is to plough furrows 20 feet apart, and to plant the trees in the furrows, filling in the soil over the roots and trampling well down.

Before planting, the roots of the young trees should be well trimmed, shaped to an even form, and cleanly cut. As the result of their removal from the nursery beds, the roots are generally more or less damaged, and numbers of the fibrous roots, becoming dry, shrivel and die. These all require a clean trimming. Then it is often desirable to remove some of the roots so as to balance the root system. The trimming of the roots gives the young tree a clean root system, and it is enabled to establish itself with young, vigorous roots.

After planting, the top should be well cut back, so as to leave three or four arms, with three or four buds on each. Where it is not possible to have this number of arms or limbs it is frequently advisable to cut back to one stem, allowing the buds to break out strongly and frame the tree after planting. In some countries, the custom of not cutting back the trees the first year is favoured. Local experience has not resulted in favour of this practice, as it is found to be inadvisable to unduly strain the young tree by leaving a heavy top to be supported by the weak-growing root system.

A number of good commercial fruits have been found to be either wholly or partially self-sterile, requiring other varieties near them to enable them to set their fruit. For this purpose it is necessary that the bloom periods should be somewhat coincident.

SPRAYING.

The time has now arrived when it is necessary to spray for the following pests—scale insects, woolly aphis, and the bryobia mite. The use of red oil has been advocated for these pests, and, as well, crude petroleum, kerosene and other oil emulsions have proved satisfactory.

The lime-sulphur spray is also one of the most effective of sprays for winter use. It is lasting, searching, and being a fungicide as well as an insecticide, is much favoured by growers as a dual spray.

Nicotine sulphate in any form, such as Nicotox or Black Leaf 40 may also be used.

The recent experiments of the Government Entomologist have disclosed a most effective spray. It is made up as follows:—One pound of soap dissolved in 1 gallon of boiling water; to this is added 1 gallon of red oil, which should have been thoroughly emulsified; then 1 pint of nicotine sulphate is stirred in and 80 gallons of water added. In this way mixture sufficient to spray 100 trees can be made. If hard water be used 1 oz. of washing soda should be added. Winter is advised as the best time for spraying.

General Work.

All ploughing should now be completed; if not, it should be finished before spraying and pruning operations are proceeded with.

Any autumn manuring or liming should also be now carried out. This, too, should be finished before spraying or pruning. Before spraying with oils or with lime sulphur wash, all rough bark on apple and pear trees should be scraped off. This will mean the certain destruction of any codlin moth larvæ hiding underneath.

The Vegetable Garden.

If not previously done, asparagus and rhubarb beds should be well cleaned out, and a top dressing of manure given. To insure good drainage, the soil from the paths, or between the beds, may be thrown up on the beds, so as to deepen the surface drainage, and to consequently warm the beds. This will mean earlier growths. A heavy dressing of manure should be given, and the beds well and roughly dug over.

Plant out seeds of tomatoes and the pumpkin family in the frames; and sow in the open seeds of peas, lettuce, spinach, broad beans, radish, onions, carrot and leek. Asparagus crowns, rhubarb roots, tubers of Jerusalem artichokes, shallots and onions may now be planted out. Celery should still be earthed up and limed, taking care not to have the beds too wet.

The Flower Garden.

General cleaning up and digging will be the work for this month in flower section and shrubbery. Where the soil is heavy or sour, or where sorrel is plentiful, the garden should be given a heavy dressing of fresh lime, a fair dusting being applied all over the surface. Lime should not be used in conjunction with leaves, garden *débris,* leaf-mould, stable manure, or any other organic matter used for humus. These should be first disposed of by digging well into the soil; then shortly afterwards a top dressing of lime may be given. Should no humic material be used, the lime may be dug in with the autumn digging.

In cleaning up gardens, all light litter and foliage should be either dug in, or, better still, it should be placed in an out-of-the-way corner to form a compost heap. Leaf-mould, well rotted, is especially useful in any garden, particularly where such plants as Azaleas, Rhododendrons, Liliums, &c., are grown, or for pot plant work it is exceedingly valuable. Lime must be kept away from these plants. In forming the compost heap, no medium whatever should be added to help the rotting down of the leaves unless it be a little sand. Any chemical added will render the mould unsuitable for its special objects.

Any hardy annuals may be planted out, such as stocks, pansies, wallflowers, &c., and cuttings of roses and hardwood shrubs may also be planted. In planting out cuttings it is very important that all the eyes should be removed from the part of the cutting which is to be below the ground. If this be not done, there will always be the subsequent danger of the plant suckering.

Roses and any summer and autumn flowering shrubs that have finished flowering may be pruned. If the spring flowering shrubs have not previously been pruned, they should be allowed to remain until after the

next flowering season. This especially applies to such plants as Spireas, Philadelphus (Mock Orange), Deutzia, Prunus Mume, and other early flowering shrubs. To prune these now would mean the certain loss of a great proportion of their flowers.

REMINDERS FOR JULY.

LIVE STOCK.

HORSES.—Those stabled and worked regularly should be fed liberally. Those doing fast or heavy work should be clipped; if not wholly, then trace high. Those not rugged on coming into the stable at night should be wiped down and in half-an-hour's time rugged or covered with bags until the coat is dry. Old horses and weaned foals should be given crushed oats. Horses at grass will greatly benefit by the addition of either hay or chaff, oats, and bran. A lick, previously recommended, should be available for all horses at grass. Old and badly conditioned horses should be given some boiled barley or linseed. Mares now approaching foaling will require careful attention, and should be kept under constant observation. It is not advisable to have mares fat at foaling time, nor is it wise to have them poor; they should, however, be kept in good working condition. The practice of working mares in shafts until they are about to foal is strongly condemned, as such a course may give rise to many foaling ailments with consequent loss of foals, and, at times, that of mares also, Commence preparing stallion for season, especially if worked.

CATTLE.—Cows, if not housed, should be rugged. Rugs should be removed and aired in the daytime when the shade temperature reaches 60 degrees. Give a ration of hay or straw, whole or chaffed, to counteract the purging effects of the young grass. Cows about to calve, if over fat, should be put into a paddock in which the feed is not too abundant. Newly-calved cows should be fed liberally to stimulate milk flow. Cows may now be served for autumn calving. Calves should be provided with warm, dry shed and liberally fed. Keep feeding utensils scrupulously clean to avoid digestive complaints.

PIGS.—Supply plenty of bedding in warm, well-ventilated styes. Keep styes clean and dry. Sows should be given a grass run.

POULTRY.—Mating of birds intended for breeding purposes should receive immediate attention. Eight second-season Leghorns or any other light breeds, or six of the heavier birds, such as Orpingtons, Plymouth Rocks, and Wyandottes (preferably in their second year), with a vigorous unrelated cockerel will be found satisfactory. Table birds bred in March or April will pay handsomely prior to the Cup Carnival. A tonic in drinking water as a preventive against chicken pox and other ailments is advantageous.

CULTIVATION.

FARM.—Finish sowing barley, peas, and beans, and late white oats in backward districts. Trim hedges. Fallow for potatoes, maize, and other summer crops; in early districts, plant potatoes. Graze off early crops where possible.

VINEYARD.—Proceed with pruning, burning off, and ploughing. Anthracnose (vine back spot) was much in evidence last season. In the event of weather conditions favorable to fungous growth, a virulent outbreak is inevitable, next spring, on all vines not adequately protected. "Swabbing" of susceptible varieties (sultana, &c.) with acid iron sulphate solution, just before bud-burst, cannot be too strongly recommended. Bulletin describing treatment will be posted on application. Complete, as early as possible, the application of manures if not already done. Mark out land for new plantations. If ground is in good order and not too wet, proceed with plantation of young vines (unpruned). Remove cuttings or scions from vines previously marked, and keep fresh by burying horizontally in almost dry sand in cool, sheltered place. Permanently stake or trellis last year's plantations.

Cellars.—Rack all young wines, whether previously racked or not. Rack older wines also. For this work choose, as much as possible, fine weather and high barometer. Fill up regularly all unfortified wines. This is a good time for bottling wine.

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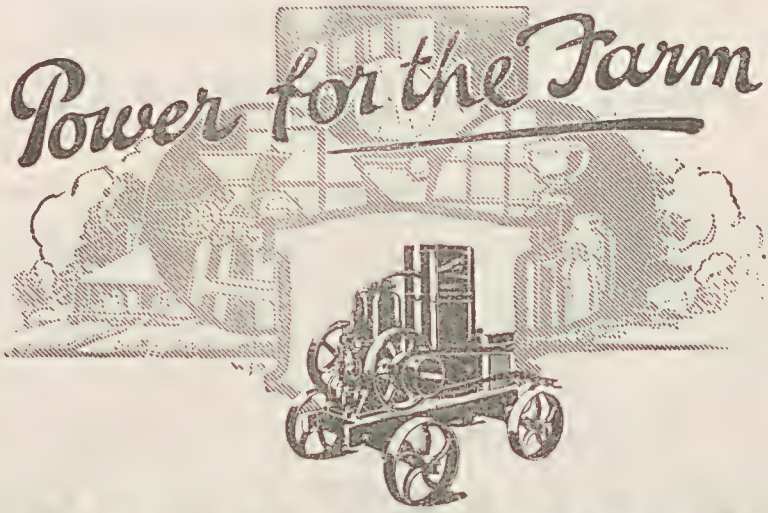

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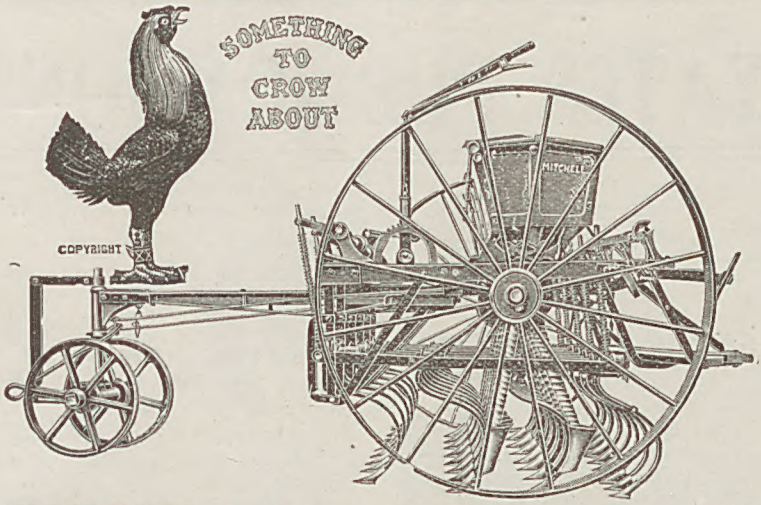

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DEPARTMENT OF AGRICULTURE, VICTORIA

Red Poll Dairy Herd

The Department has now completed the orders for calves that were booked ahead of calving when the advertisement was withdrawn; consequently the booking of orders for bull calves from the forthcoming calvings has now been resumed.

BULL CALVES are sold for delivery at a month old at prices based approximately on the actual milk and butter fat record of the dam at the rate of 1s. per lb. of butter ***fat*** yielded. Thus a calf from a cow with a 400 lbs. butter fat record is sold for 20 guineas, one from a 300 lb. butter fat cow for 15 guineas, and so on. Bull Calves *ex* heifers on their first calf are sold for a set price of 10 guineas.

(For Record of Yields of dams see Red Poll Herd Book.)

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Sire: Nicotine (69 A.A.). Dam: Velveteen (Imp.) 22875 (2 A.A.).

VICTORIA VOLCANO (322 A.)

Sire: Nicotine (69 A.A.) by Acton Dewstone (imp.) 9524 (4 A.A.).

Dam: Tonga (253 A.) by Honingham Archbishop (imp.) 9702 (48 A.A.).

Tonga's butter fat yields for 6 successive lactation periods are as follow:—1916, 341 lbs.; 1917, 398 lbs.; 1918, 419 lbs.; 1919, 479 lbs.; 1920, 428 lbs.; 1921, 562 lbs.

BELLIGERENT (Imported) 11096 (8 A.A.)

Dam's Record (1st milking)	7144 lbs. milk.					
Dam's Dam's	,,	14533 lbs. milk	...	4 years average	12871 lbs. milk.	
Sire's Dam's	,,	10370	,,	... 7	,, ,,	9354 ,,
Sire's D. Dam's	,,	9510	,,	... 12	,, ,,	8033 ,,
G. Sire's D. Dam's	,,	10215	,,	... 7	,, ,,	9386 ,,
G.G. Sire's D. Dam's	,,	12565	,,	... 10	,, ,,	8853 ,,
G.G.G. Sire's D. Dam's	,,	10088	,,	... 2	,, ,,	9754 ,,

Inspection of the Herd is Invited.

Visitors will be met at the Station on notifying the Manager, State Research Farm, Werribee.

Application for purchase to

Dr. S. S. CAMERON, DIRECTOR OF AGRICULTURE, MELBOURNE.

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